

THE RELATIONSHIP OF ATTENTION DEFICIT/ HYPERACTIVITY DISORDER  
AND THE SELF-ESTEEM OF COLLEGE WOMEN

A Dissertation

by

RENI JOSEPH

Submitted to the Office of Graduate Studies of  
Texas A&M University  
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

May 2009

Major Subject: School Psychology

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## ABSTRACT

The Relationship of Attention Deficit/ Hyperactivity Disorder and the Self-Esteem of  
College Women. (May 2009)

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The symptoms of females with Attention Deficit/Hyperactivity Disorder (AD/HD) have been underreported, possibly due to the fact that their symptoms of inattention are often overlooked. Research has revealed that individuals report low self-esteem as a result of undiagnosed AD/HD. Thus, if these individuals are not diagnosed and exposed to the proper treatment for their AD/HD symptoms, they may continue to endure progressive psychological impairments in the years to come. The current study is an attempt to contribute to the literature concerning the presentation and outcome of AD/HD in women. This study aims to determine the relationship of self esteem and AD/HD in college women.

A sample of 74 women participated in this study. A total of 24 students diagnosed with AD/HD and 50 students without AD/HD comprised the sample. Participants completed a demographic questionnaire and an AD/HD and Self-Esteem inventory.

Results of this study indicated that women who were diagnosed with AD/HD scored higher than the comparison sample on all scales measuring AD/HD symptoms.

As predicted, AD/HD symptoms were found to be negatively related to self-esteem. On the other hand, no significant correlations were found between the age of women when they were first diagnosed with AD/HD and their current level of self-esteem. It was also determined that family support was related self-esteem. Thus, family support was examined as a moderator of the relation between self-esteem and AD/HD.

Unfortunately, family support does not appear to moderate the relation between AD/HD and self-esteem.

Limitations of this study included a small sample size, the use of self-reports, not examining subtypes of AD/HD individually, and not requiring a medication abstinence period.

Despite limitations, this study provides some insight on the outcomes of women with AD/HD. It also provides evidence for the need of additional research in the area of women with AD/HD; their life-span experience with AD/HD and the effects of a late diagnosis. Further studies in this area of interest that include larger sample sizes from multiple postsecondary institutions will be necessary to determine that the results in this study are in fact generalizable to other college women diagnosed with AD/HD.

## DEDICATION

I would like to dedicate my dissertation to my parents. It is because you left your home and moved to a foreign country with hopes of providing your children with better educational opportunities and a promising future that I even got the chance to make this dream a reality.

## ACKNOWLEDGEMENTS

Psychology was always a topic of curiosity for me, but over the years my interest developed into an educational goal and now into a career path. I thank God for instilling upon me that initial seedling of interest that with motivation, perseverance, and a little bit of ambition has grown into a purpose for my life. Without Him, none of this would have been possible.

To my mom, dad, and brothers, I want to thank you all for allowing me to follow my heart in making my educational decisions and choosing my career goals. Despite not knowing much about the field of Psychology, you have always supported me. Throughout my graduate studies, you have always been patient and understanding and you have never doubted my abilities.

To my friends, you know who you are, I want to thank you all for the prayers, encouragement, and well wishes over the past years. It is because you all have shown a constant interest in my dissertation progress that I finally mustered up the motivation to complete it. I'd like to also thank my co-investigator for all of his help with my study. Not only were you a supportive friend, but you were also a reliable research assistant.

To the Texas A& M University School Psychology faculty members, thank you for providing me with the skills necessary to succeed in this field. I'd like to especially thank my chair for always having faith in my potential. The support you give and patience you show to your students are qualities that I have greatly appreciated.

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## CHAPTER I

### INTRODUCTION

Some students in our schools have various learning disabilities, disorders, and physical handicaps that may affect or hinder their academic and social success. Disabilities such as dyslexia and anxiety are identified and then cared for by providing the student with proper modifications and accommodations in school. However, what happens if the student has a disability that may not be as easily identified as those mentioned previously? How will this student get the needed support or assistance required for his or her success? Will the student develop adverse outcomes because of the disability that would otherwise have been preventable if the disorder was diagnosed and treated earlier? For instance, a student may have symptoms of a disability that may not be as apparent to parents or teachers, and that require much closer observation, such as the symptoms of inattention. The attentional problems that are associated with Attention Deficit/Hyperactivity Disorder (AD/HD) are often overlooked because they are not as easily visible as observable behavioral issues and symptoms of other disorders.

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This dissertation follows the style of *Archives of Clinical Neuropsychology*.

AD/HD is a condition that affects multiple aspects of mood, cognitive abilities, behaviors, and daily life. It's a common neurobiological condition that affects 5-8 percent of school age children with symptoms persisting into adulthood in 30-60 percent of cases or 3-4 percent of adults (Fargason & Ford, 1994 in Rucklidge, Brown, Crawford, & Kaplan, 2007). It may be inherited and affects certain types of brain functioning. AD/HD can cause problems in school, jobs, at home, in family, and other relationships, and with daily living tasks. AD/HD can make childhood, or peer relationships difficult. Researchers have found that children with AD/HD face challenges such as disturbed relationships with their peers, difficulty making and keeping friends, and inappropriate social behavior (Nadeau, 2002; Dodson, 20002). The first prospective studies recognizing that AD/HD continued into adulthood in a significant proportion of cases were published in the mid 1980's (Gittelman, Mannuzza, Shenker, & Bonagura, 1985; in Rucklidge et al., 2007; Hechtman, Weiss, Perlman, & Amsel, 1984). Long-term outcome studies suggested that these problems continue into adulthood and impede the social adjustment of adults with AD/HD (Gittelman et al. 1985; Weiss & Hechtman, 1993). There is presently no cure for AD/HD; however, when it is properly diagnosed and treated, AD/HD can be well managed, leading to improvements in daily functioning and satisfaction in life. The earlier a child's difficulties with their peers are noticed, the more successful intervention may be. A diagnosis of AD/HD is usually determined with a diagnostic evaluation administered by a licensed mental health professional or a physician based on the number, the severity, and the duration of the symptoms present and the degree to which these symptoms cause

impairment in an individual's life (American Psychiatric Association, 1994; Barkley & Biederman, 1997; Barkley, 2000; Vaughn, Riccio, Hynd, & Hall, 1997).

The Diagnostic and Statistical Manual of Mental Disorders-Fourth Edition Text Revision (DSM-IV-TR) categorized Attention Deficit/ Hyperactivity Disorder (AD/HD) into two symptom groups with three subtypes of this disorder; Predominantly Inattentive, Predominantly Hyperactive, and the Combined Type, which includes both symptom groups (American Psychiatric Association, 1994, 2000). It also includes AD/HD Not Otherwise Specified (NOS) (American Psychiatric Association, 1994, 2000). The American Psychiatric Association (1994) defines Attention Deficit/Hyperactivity Disorder (AD/HD) on the basis of developmentally-inappropriate levels of inattention and/or overactivity-impulsivity. The DSM-IV-TR states that some hyperactive-impulsive or inattentive symptoms that cause impairment must have been present before the age of seven years and the symptoms must have been present for at least six months. The impairment caused from the symptoms must also be present in at least two settings, for example, at home and at school or work, and not be better accounted for by some other variable or condition. This impairment may be described as identifiable interference with developmentally appropriate social, academic, or occupational functioning (APA, 2000).

The exact cause of AD/HD is unknown; however, there is evidence that AD/HD has a biochemical origin. AD/HD is seen as a neurobiological, developmental disorder of self-control that affects millions of individuals and interferes with many aspects of their lives (Barkley, 2000; Quinn, 2005). It is believed that symptoms of AD/HD are

caused by improperly functioning chemicals in the brain. More specifically, the neurotransmitters or the “chemical messengers” in the brain have deficiencies that prevent the brain from working as it should. This in turn causes symptoms of AD/HD in the individual. Experts have stated that it is perhaps related to dysfunction in neural pathways and insufficient amounts of dopamine and norepinephrine in the brain (Barkley, 2000; Nadeau, 2002). These neurotransmitters are the chemicals in the brain that allow brain cells to transmit information to other nerve cells. These messengers are released at the synapse of a neuron to help messages move across to the next neuron. When the normal flow of messages is interrupted in an individual, they may have difficulty paying attention, controlling impulses, and regulating motor activity (Barkley, 2000, Quinn, 2005).

Treatment of AD/HD may involve a multimodal approach that includes medication, psychotherapy, and stress management. It is known that stimulant medications, which affect neurotransmitters in the central nervous system, help to reduce the symptoms of AD/HD (Nadeau, 2002). These stimulant medications stimulate the central nervous system by promoting the release of dopamine, norepinephrine, and serotonin. In other words, the area of the brain that the stimulant drugs activate is actually responsible for inhibiting behavior and maintaining effort or attention to tasks. So by increasing the amount of neurotransmitters that are released in this area of the brain, the halting power of the brain over behavior will be increased, but only to optimum levels.

Evidence showing a biochemical cause of AD/HD symptoms is also based on research of several other areas. For instance, AD/HD seems to be inherited. Many times a parent recognizes their own AD/HD after one of their children receives a diagnosis. As a parent learns more about AD/HD symptomatology in their children, they begin to see many similar patterns in themselves. AD/HD is now accepted to be inherited, but tends to run in some families more than others.

Approximately one to three students in every classroom of thirty students has the disability of AD/HD. Although the diagnostic criteria are neutral with respect to gender and age, the disorder has been mostly associated with school-aged boys. This may help explain why most of the research on AD/HD has focused exclusively on boys.

Knowledge of AD/HD in girls is not as extensive as it is in boys (Sharp, Walter, Marsh, Ritchie, Hamburger, & Castellanos, 1999). In earlier studies, it was found that AD/HD is three to six times more common in boys than in girls. School-age boys (ages 4 to 17) on average are 2.5 to 3.6 times more likely to be diagnosed with AD/HD than are girls, and the ratio of boys to girls in clinic populations range from 6:1 to 9:1 (APA, 1994; Barkley, 1996; Centers for Disease Control and Prevention [CDC], 2005). Some studies that have been conducted on girls have done so by using gender comparisons.

Surprisingly, these studies have actually found more similarities than differences between girls and boys with AD/HD (Gaub & Carlson, 1997). One study using DSM-IV criteria on Australian school children found the overall rate of AD/HD for both genders to be 24% and the male to female ratio was found to be 5:1 (Gomez, Harvey, Quick, Scharer, & Harris, 1999).

Attention Deficit/ Hyperactivity Disorder was initially thought to be a childhood disorder and it was believed that symptoms resolved after the individual reached adolescence when their brain developed and the individual matured. However, AD/HD is now also increasingly being applied to adults as also an adult disorder. The National Women's Health Resource Center (Healthywomen.org, 2003) acknowledged that while AD/HD affects at least 7.5% of all school aged children it also affects at least 4.5% of all adults. Follow-up studies of AD/HD in children show that 30-50% become adults with AD/HD (Barkley, 1990). It is now estimated that AD/HD symptoms affect 2-4% of the college student population (DuPaul & Weyandt, 2006). Further research reveals that approximately 30-70% of those individuals diagnosed in childhood will continue to demonstrate significant distress in adolescence and adulthood (Hunt, 1997; Spencer, Biederman, Wilens, Prince, Hatch, Jones, Harding, Faraone, & Seidman, 1998). AD/HD is a lifespan condition that affects children, adolescents, and adults of all ages. It affects both males and females, and people of all races and cultural backgrounds.

A common myth regarding AD/HD is that it will always be diagnosed in childhood. An early diagnosis may vary depending on the type of AD/HD a child has. Children who have AD/HD Predominantly Hyperactive/Impulsive Type are usually diagnosed earlier in their lives. On the other hand, not every child with AD/HD is hyperactive, acts out, or cause problems during their early school years. These children are usually Predominantly Inattentive; they are frequently overlooked and may not be diagnosed until later in their lives. During their younger years their teachers may describe them as being well behaved while as teenagers, they tend to have lower energy

levels and may be described as unmotivated or lethargic at times. Depression and anxiety may be more common in teenagers with this type of AD/HD. Individuals with AD/HD Predominantly Inattentive Type are found to be less talkative as those that are the Predominantly Hyperactive/Impulsive. These individuals are less likely to be socially aggressive, oppositional, or defiant. Their symptoms of AD/HD become apparent and are more likely to surface later in their academic career when academic tasks increase and become more difficult. In actuality, AD/HD is often overlooked in many teenagers and adults because diagnostic criteria were not developed for them (Murphy & Barkley, 1996). The diagnostic criteria found in the DSM-IV-TR describe the behavior of younger children, not of teenagers or young adults. The recognition that AD/HD can also affect adults has resulted in many adults being identified who were not diagnosed as children (Faraone, Biederman, Feighner, & Monuteaux, 2000; Sachdev, 1999; Wender, Wolf, & Wassersein, 2001).

Problems associated with this disorder are apparently different among children and adults. The problems that are common in children may include talking excessively, blurting out answers, and having trouble staying seated. Inattention and impulsivity can contribute to disorganization, failure to complete work, and talking back to peers or adults. These behaviors can lead to criticism, punishment, and rejection from parents, teachers, and peers. As a result, children with AD/HD may have lower self-esteem than those without AD/HD. For some children, hyperactivity is a classic indicator of AD/HD. By adolescence, hyperactivity usually subsides and is replaced by rebelliousness or restlessness (Murphy & Barkley, 1996; Ratey, Greenberg, Bemporad, & Lindem, 1992).



It is known that the number of neurotransmitters increases with age. This helps to explain why children with AD/HD seem to outgrow some of their symptoms as they get older. Parents and teachers will often complain that these teenagers have difficulty following rules and instructions. These students are at risk of school failure, suspension, substance abuse, pregnancy, speeding tickets, car wrecks, and suicide. Inattention is most often observed when adolescents with AD/HD are asked to engage in repetitive tasks such as schoolwork, homework, or chores. A common theme of many teenagers with the disability of AD/HD is underachievement in school. These students tend not to perform as well as expected academically. Individuals with any of the subtypes may have problems with inattention or failure to complete work, but this may occur for different reasons.

Several interventions currently exist for assisting students with AD/HD who experience adverse effects in their learning and academic performance. Informal classroom accommodations, behavior management programs, development and more explicit implementation of classroom accommodations through a 504 plan, and identification of an educational handicapping condition to receive special education services are interventions that are used in schools today.

In recent years, researchers have recognized that there is a substantial population of women with AD/HD who were not diagnosed in childhood. A possible explanation is that AD/HD manifests differently in males and females; this may clarify why girls with this disorder are often overlooked. Girls with AD/HD are more likely to be of the inattentive but not the hyperactive type, differing from AD/HD diagnosed boys (Quinn,

Wigal, Swanson, Hirsch, Ottolini, Dariani, Roffman, Zeldis, & Cooper, 2004). AD/HD may also be less accepted for girls because of social expectations about female and male behaviors. Girls with AD/HD are often overlooked because they usually do not display major behavior problems that are characteristic of the AD/HD Predominantly Hyperactive/Impulsive subtype. Although girls with AD/HD may not have as many discipline problems as boys with AD/HD, the problems that they encounter are just as serious. When girls with AD/HD are overlooked or left undiagnosed until later in their lives they may be more susceptible to be at risk for various health and social implications in addition to the comorbid mental health conditions already associated with the disorder when occurring in women. There is relatively little information about how women with AD/HD are able to manage the symptoms and effects of the disorder and how they function socially and academically. Women with AD/HD have been found to be at an increased risk for depression, anxiety, and low self-esteem (Nadeau, 1995; Quinn, 1997). Females with AD/HD are also more likely to have lower academic achievement, greater impairment in cognitive functioning, and problems in attaining an advanced education (Barkley, 1998; Quinn, 1997; Nadeau, 1995; Solden, 1995). A study conducted by Rucklidge and Kaplan (1997) found that women with AD/HD reported more depressive symptoms, were more anxious, more stressed, had an external loci of control, and had lower self-esteem. Women with AD/HD seem to experience more psychological distress and have lower self-image than men with AD/HD (Arcia, & Conners, 1998; Katz, Goldstein, & Geckle, 1998). Studies have also shown that compulsive overeating, alcohol abuse, and chronic sleep deprivation may be present in

women with AD/HD (Dodson, 2002; Fleming, & Levy, 2002; Richardson, 2002). When compared to women without AD/HD, those women diagnosed in adulthood are more likely to have depressive symptoms, are more stressed and anxious, have more external locus of control (tendency to attribute success and difficulties to external factor such as chance), have lower self-esteem, and are engaged more in coping strategies that are emotion-oriented (use self-protective measures to reduce stress) than task-oriented (take action to solve problems; Rucklidge et al., 1997). Delay or lack of appropriate diagnosis and treatment can also result in low self-esteem, anxiety and depression, and other mental health implications.

Self-esteem is defined as the positivity of a person's self evaluation. As an evaluation it contains both cognitive and affective elements that can in turn influence one's thoughts as well as one's mood (Baumeister, Dori, & Hastings, 1998). As mentioned earlier a later diagnosis of AD/HD can affect several aspects of a woman's life including academically and emotionally, which in turn can affect the individual's level of self-esteem. Thus, it is important that clinicians, teachers, and parents be aware that although the disorder manifests differently among boys and girls the symptoms can cause equally hindering outcomes.

Several disorders have symptoms that are similar to AD/HD. Some health problems have symptoms of low energy and can be mistaken for symptoms of AD/HD Predominantly Inattentive Type. So identifying and ruling out other health and mental health problems is important.

Other mental health conditions can occur at the same time as AD/HD. The most common problems that are found to be comorbid with AD/HD include Oppositional Defiant Disorder (ODD), Conduct Disorder (CD), anxiety disorders, learning disabilities (LD), speech and language disorders and depression. When depression is present, it is found to more likely occur in individuals with sleep disturbances and have also been found to have a diagnosis of AD/HD. Other problems that are apparent, but found less often include obsessive-compulsive disorder, Tourette syndrome, substance abuse, and bipolar disorder (Barkley, 1998; Barkley, Fischer, Mariellen, Smallish, & Fletcher, 2006; Span & Earlywine, 2004; Szbot & Bukstein, 2008). Research has shown that girls with AD/HD are more likely to have language difficulties, cognitive problems, problems with social relationships, and be rejected by peers more often than boys do (Barkley, 1998; McGee & Feehan, 1991; Quinn, 2005). It has been found that girls who are hyperactive/impulsive have more anxiety and tension problems than boys who are hyperactive/impulsive. It has also been found that family members tend to have a history of learning disabilities and anxiety disorders more often than in those families with AD/HD Predominantly Hyperactive/Impulsive Type. The under-diagnosis of girls with AD/HD is clearly a serious problem.

Many factors can help determine how well an individual is able to cope with the symptoms of AD/HD. Research has shown that a higher intelligence, emotional stability, less aggression, an ability to get along with peers, middle to upper socioeconomic status, a supportive home, emotionally healthy parents, and positive parenting practices can make it more likely that an individual can successfully cope with AD/HD (Tzelepis,

Schubiner, & Warbasse, 1995; Ratey, Greenberg, Bemporad, & Lindem, 1992; Okie, 2006). A diagnosis may also be evaded if a student is intelligent and can compensate for their symptoms of AD/HD. Less severe hyperactivity in the individual as a younger child or less disruption in the normal flow of neurotransmitters can also help an individual cope better with their symptoms of AD/HD (Barkley, 2000). Although individuals may have protective influences that help mediate or hide their AD/HD symptoms, it is important to understand that they are not guaranteed to always be present in one's life. Thus, it is important for clinicians, teachers, and parents to be cognizant of a possible underlying diagnosis in children who have positive protective influences in their lives, as well as in those that do not.

## CHAPTER II

### LITERATURE REVIEW

In an attempt to understand AD/HD and the developmental course and adult outcome of women with AD/HD, a review of the existing research on this disorder was conducted. The areas of focus of this literature review are the history of AD/HD, diagnostic criteria of AD/HD, neurological basis of AD/HD, comorbidity and diagnosis of AD/HD, gender and AD/HD, women and AD/HD, and risk factors of AD/HD with a focus on self-esteem.

AD/HD was first described as a diagnostic category in the second edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-II American Psychiatric Association, 1968). This disorder was a behavioral diagnosis called hyperkinetic reaction of childhood (DSM-II) (American Psychiatric Association, 1968). With the third edition of the DSM, the diagnostic category was changed to Attention Deficit Disorder with Hyperactivity (ADHD) and Attention Deficit Disorder without Hyperactivity (ADHDw American Psychiatric Association, 1980). It was around this time when researchers began to find interest in AD/HD and adulthood. Adults were recognized for the first time as having the disorder with the addition of a classification for Attention Deficit Disorder-Residual Type (ADD-RT) in the DSM-III (American Psychiatric Association, 1980).

The revised edition of the DSM-III (DSM-III-R) (American Psychiatric Association, 1987) once again included hyperactivity, impulsivity, and inattention into

one description, Attention-deficit/Hyperactivity Disorder (AD/HD). The classification of Undifferentiated Attention Deficit Disorder was then used to describe Attention-Deficit without Hyperactivity that was previously used in the DSM-III (American Psychiatric Association, 1980).

The issue of AD/HD with and without hyperactivity was addressed again with the publication of the DSM-IV (American Psychiatric Association, 1994). AD/HD was divided into two symptom groups with three types: (1) predominantly hyperactive, (2) predominantly inattentive, and (3) combined type which includes both sets of symptoms in the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) (American Psychiatric Association, 1994, 2000). It also includes AD/HD Not Otherwise Specified (NOS) (American Psychiatric Association, 1994, 2000). Disorders that presented symptoms like hyperactivity, impulsivity, or inattention, but do not meet the criteria for AD/HD, are designated AD/HD, Not Otherwise Specified.

The fundamental feature of Attention Deficit/Hyperactivity Disorder as defined in the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition-Text Revision* (DSM-IV-TR; American Psychiatric Association [APA], 2000) is a persistent pattern of inattention and/or hyperactivity-impulsivity that is more frequently displayed and more severe than is typically observed in individuals at a comparable level of development. There are nine symptoms described for each group. Six or more of the symptoms in at least one symptom group must be present to confirm a diagnosis of AD/HD. The DSM-IV-TR states that some hyperactive-impulsive or inattentive symptoms that cause impairment must have been present before the age of seven years

and the symptoms must have been present for at least six months. The impairment caused from the symptoms must also be present in at least two settings, for example, at home and at school or work, and not be better accounted for by some other variable or condition. This impairment may be described as an identifiable interference with developmentally appropriate social, academic, or occupational functioning (APA, 2000). AD/HD is a neurobiological, developmental disorder of self-control that affects millions of individuals and interferes with many aspects of their lives (Barkley, 2000; Quinn, 2005).

Although the diagnostic criteria are neutral with respect to gender and age, the disorder has been mostly associated with school-aged boys. This may help explain why most of the research on AD/HD has focused exclusively on boys. Knowledge of AD/HD in girls is not as extensive as it is in boys (Sharp, Walter, Marsh, Ritchie, Hamburger, & Castellanos, 1999). School-age boys (ages 4 to 17) on average are 2.5 to 3.6 times more likely to be diagnosed with AD/HD than are girls, and the ratio of boys to girls in clinic populations range from 6:1 to 9:1 (APA, 1994; Barkley, 1996; Center for Disease Control and Prevention [CDC], 2005). A study using DSM-IV criteria on Australian school children found the overall rate of AD/HD for both genders to be 24% and the male to female ratio to be 5:1 (Gomez, Harvey, Quick, Scharer, & Harris, 1999). Most studies that have been conducted on girls have done so by using gender comparisons. These studies have actually found more similarities than differences between girls and boys with AD/HD (Gaub et al., 1997).



It was initially thought to be a childhood disorder; however, Attention Deficit /Hyperactivity Disorder is also increasingly being applied to adults as also an adult disorder. It was once considered a disorder that children outgrew during adolescence as their brains matured; AD/HD is now thought to persist, at least in some, into adulthood. The National Women's Health Resource Center (Healthywomen.org, 2003) acknowledged that AD/HD affects at least 7.5% of all school aged children and 4.5% of all adults. The prevalence of AD/HD in school aged children as listed in the DSM-IV-TR has been estimated at 3-7%, or more than two million. This means that at least one or even two children with AD/HD are in every classroom throughout the United States (Barkley, 2000). It is also estimated that AD/HD symptoms affect 2-4% of the college student population (DuPaul & Weyandt, 2006). Follow-up studies of AD/HD in children show that 30-50% become AD/HD adults (Barkley, 1990). Based on research, it is now estimated that 30-70% of those individuals diagnosed in childhood will continue to demonstrate significant distress in adolescence and adulthood (Hunt, 1997; Spencer et al., 1998). Although AD/HD is historically considered a disorder of children, it is now recognized as also being a disorder in adults.

### *Etiology*

Several theories regarding the etiology of AD/HD have been explored by researchers including biological influences and parenting styles (Barkley, 1998). The most recent research has focused on the neurological and genetic basis of the etiology of AD/HD. It is thought by some that AD/HD is a neurobiological, developmental disorder of self-control that affects millions of individuals and interferes with many aspects of

their lives (Barkley, 2000; Quinn, 2005). Wender, Epstein, Richard, Kopin, and Gordon (1971) produced the first theory of AD/HD when he discovered that children with AD/HD did not metabolize the monoamines serotonin, dopamine, and norepinephrine in the same way that children without AD/HD did. More recently, researchers have focused on examining the brain and how impairments in the brain may be related to symptoms of AD/HD. Zametkin, Nordahl, Gross, and King (1990) found that glucose metabolism was lower in adults with AD/HD than in those without AD/HD in the areas of the brain primarily responsible for controlling attention and motor activity. Frontal lobe disinhibition in individuals with AD/HD was hypothesized with later studies (Barkley, Grodzinsky, & DuPaul, 1992; Zametkin et al. 1990; Barkley, 2000). Barkley (1997) reported that behavioral inhibition is the core symptom of AD/HD.

When AD/HD is present in an individual, the messages move down the neuron, but then stop and don't always move across the synapse to the next neuron. The exact cause of AD/HD is unknown; however, experts have stated that it is perhaps related to dysfunction in neural pathways and insufficient amounts of dopamine (Barkley, 2000; Nadeau, Littman, & Quinn, 1999). Researchers feel that those individuals with AD/HD Predominantly Hyperactive/Impulsive have deficiencies in the neurotransmitter dopamine. Dopamine is a chemical that is known to be involved in inhibiting the activity of other cells in the brain (Barkley, 2000). Studies done on the brain and AD/HD confirmed frontal lobe disinhibition in individuals with AD/HD (Barkley et al., 1992). Behavioral inhibition is considered to include the ability to generate and keep a delayed response to an event, thought, or emotion. So an inability to do so would reflect

impulsivity. Other scientists have suggested that along with dopamine the neurotransmitter norepinephrine is also deficient in those individuals with AD/HD, and thus, preventing the proper relay of messages (Barkley, 2000). Neurotransmitters are chemicals in the brain that allow brain cells to transmit information to other nerve cells. The prefrontal and limbic portions of the brain are believed to be the major sites with neurotransmitter problems. Researchers also feel that the posterior cortical areas of the brain have neurotransmitter problems in individuals with AD/HD Predominantly Inattentive Type. As stated above, the neurotransmitters, dopamine and norepinephrine, may be found in smaller amounts in the brains of individuals with AD/HD. Findings from studies with adolescents suggested that the neuropsychological deficits evident in children do not disappear over time (Seidman, Biederman, Faraone, Weber, & Oullette, 1997). Thus, stimulant drugs that affect the neurotransmitters dopamine and norepinephrine, are used to temporarily improve the symptoms of those individuals with AD/HD, by increasing the amount of these chemicals in the brain (Barkley, 2000). Barkley (2000) explained that the areas of the brain that are the richest in dopamine include the orbital-frontal region and its connections to the caudate nucleus, which is a part of the striatum. Thus, the neurotransmitters are found in smaller amounts in these particular areas of the brain in those individuals with AD/HD. Hypofunctioning of the prefrontal cortex has been proposed to explain reduced attention and impulsiveness while hyperfunctioning of the striatum underlies increased motor activity (Dinn, Robbins & Harris, 2001; Teicher & Andersen, 1997). The striatum is an important area of the brain in regards to inhibiting behavior and sustaining attention (Barkley, 2000). In other

words, the area of the brain that the stimulant drugs activate is actually responsible for inhibiting behavior and maintaining effort or attention to tasks. So by increasing the amount of neurotransmitters in this area of the brain will increase the halting power of the brain over behavior only to optimum levels.

### *Genetic Basis of AD/HD*

The research reviewed suggests that neurological and genetic factors are the greatest contributors to the disorder of AD/HD. Researchers have evidence that AD/HD has a biological basis. Family studies show that the heritability of the disorder is high and similar to that of bipolar disorder or schizophrenia (Okie, 2006). Each sibling of a child with AD/HD has about a 20 percent chance of also having it, and 15 to 20 percent of parents with a child with the disorder will also have it (Okie, 2006). Research studying identical and fraternal twins has revealed a higher incidence of AD/HD in identical twins compared to fraternal (Gillis, Gilger, Pennington, & DeFries, 1992). There is evidence to support a long-term developmental course for individuals with AD/HD as well as familial patterns (National Institutes of Health Consensus Developmental Panel [NIH], 2000). It has also been found in family-genetic studies that parents of AD/HD children report symptoms compatible with the diagnosis (Biederman, Faraone, Keenan, & Benjamin, 1992). Family histories (Faraone, Biederman, Keenan, & Tsuang, 1991), rate of both internalizing and externalizing comorbid disorders, parental psychopathology, and response to stimulant medication (Sharp et al., 1999) are similar for girls and boys. International psychiatric studies of children suggest that when

uniform diagnostic criteria are applied and the populations that are studied are similar in age and sex ratios, the frequency of AD/HD is similar worldwide (Faraone et al., 2003).

#### *Age Differences in Manifestation of AD/HD*

Research has indicated that an overproduction of dopamine receptors occurs before and during puberty in boys, while girls on the other hand, experience an increase in estrogen starting at puberty, which then causes an increase in dopamine receptors, but not necessarily available dopamine. Boys' receptor density is reduced by 55% by adulthood; this can possibly explain their remitting hyperactivity (Andersen & Teicher, 2000; Taylor & Keltner, 2002). These natural processes may help explain why boys' symptoms begin to relinquish at the time when girls' symptoms seem to appear. Since females have different hormonal influences that can greatly affect their behavior, one cannot make the assumption that what applies to males will apply to females.

#### *Diagnosis of AD/HD*

There is actually no single measure or method of testing that is consistently used to diagnose AD/HD in children or adults at this time. The diagnosis of this disorder is subjective and tends to rely on self-reports based on rating scales or clinical interviews specific to the DSM-IV criteria for Axis I or II disorders. A study conducted by Vaughn, Riccio, Hynd, and Hall (1997) compared the effectiveness of discerning AD/HD subtypes using two rating scales. Results of this study indicated that the Behavior Assessment System for Children-Teacher Rating Scale (BASC-TRS) has a better predictive ability for children who do not meet AD/HD criteria. It was also found that

for subtypes of AD/HD, specifically AD/HD Predominantly Inattentive subtype, results show preference for the use of the BASC-TRS and Parent Rating Scale (PRS).

As mentioned earlier, current diagnostic criteria in the DSM-IV, indicates that the age of onset should be prior to age 7; however, it has been suggested that in regards to adults, this may be too restrictive since an accurate recollection of age of onset by an individual or his/her parent may not be possible in all situations (Shaffer, 1994; Barkley & Biederman, 1997). Although the use of self-report data only for the diagnosis of AD/HD has been considered questionable for many reasons (Smith, Pelham, Gnagy, Molina, & Evans, 2000); some researchers, Barkley, Fischer, Smallish, and Fletcher (2002) for example, actually found moderate correlations between adult self-recollections and parent recollections. The study revealed that adults tended to underreport symptoms as compared to parents and this could lead to the underdiagnosis of AD/HD. In another study, differences in parent and self-ratings suggested that the difficulties individuals experienced in childhood were more relevant to the parents than to the undergraduates (Carlson, Booth, Shin, Canu, 2002). The diagnosis of AD/HD in adults continues to be an area of controversy (Faraone, Biederman, Feighner, & Monuteaux, 2000). Others have suggested that the way in which the disorder manifests may change over the course of development (NIH, 2000) and that the use of the child-based criteria may be too limiting (Murphy & Barkley, 1996). Various experts have expressed concern about the application of childhood characteristics in the diagnosis of the disorder in adulthood (Barkley, 1998; Sachdev, 1999; Stein, Fischer & Szumowski, 1999; Wender, Wolf, & Wasserstein, 2001).

The DSM-IV-TR (American Psychiatric Association, 1994) is the primary source that is used in the diagnosis of AD/HD; however, an age-related bias is apparent in the diagnostic criteria which focuses on childhood symptomology. Researchers have begun to agree that the DSM-IV-TR criteria used to diagnose AD/HD are inappropriate for adults, and even less so for women (Barkley, 1997). A diagnosis for AD/HD requires that the individual have at least six symptoms, however, since the criteria are not age-appropriate, most adults with AD/HD may only present three to four of those symptoms.

The diagnosis of AD/HD in adults is more challenging than diagnosis in children. The criteria for diagnosis of AD/HD as set forth in the DSM-IV were determined based on the extent literature and field trials (Lahey, Applegate, & McBurnett, 1994) with the intent of maximizing sensitivity and specificity (Frick, Lahey, Applegate, & Kerdyck, 1994). The DSM-IV field trials are the earliest investigation of AD/HD, predominantly inattentive children. The field trials were on children; sensitivity and specificity was based on the base rates of the behaviors in the general population of children. Current criteria detailed in the DSM-IV were based on field trials with children. Although all criteria are more frequently endorsed by adults with AD/HD as compared to adults with no diagnosis, only eight of the inattention criteria are consistently endorsed by significantly more adults with AD/HD. The symptoms that most characterize AD/HD in children are not necessarily sensitive to AD/HD in adulthood.

Children are typically diagnosed with this disorder in the early school years; however, many individuals are diagnosed later in their lives, even though their symptoms have been present for many years. It has been indicated that fewer than half

of all children who have AD/HD are diagnosed or properly treated for the disorder (Barkley, 2000). Manifestations of this disorder appear to change with the development of the individual. It has been reported that although symptoms of hyperactivity tend to decrease with age, symptoms of inattention can remain stable throughout the individuals' life (Hart, Lahey, Loeber, Applegate, & Frick, 1995). Other symptoms of this disorder seem to become more apparent as the individual develops. For instance, Barkley (1997) reported that problems with executive functioning increase with age. However, the current DSM-IV-TR criteria do not reflect these developmental changes. When all factors are considered, Heiligenstein concluded that DSM-IV criteria were too stringent for use in adult diagnosis (Heiligenstein, 2000).

#### *Differences in Appearance from Age 7 to Adulthood*

The diagnostic criteria of the DSM-IV-TR (American Psychiatric Association, 1994) focuses on childhood symptoms. The core symptoms of the childhood disorder of AD/HD, hyperactivity, impulsivity, and inattention are also evident in adults with AD/HD; however, they may have a different clinical presentation. The impacts of AD/HD symptoms are not clear among children and adults. AD/HD symptoms in young girls may be hard to identify since hyperactivity is not usually diagnosed. However, if hyperactive and impulsive behaviors are evident, they are likely to be seen as excessive talking, having difficulty waiting or taking turns, fidgeting and squirming, and interrupting or intruding on others (Dietz & Montague, 2006). Girls displaying hyperactive/impulsive symptoms are easy to identify since they fit the traditional profile of AD/HD, these girls may engage in behaviors such as climbing and throwing things.



These girls may even punch or hit their classmates when they become upset or excited (Quinn, 2005). The impacts of hyperactivity and impulsiveness may also be noticed in girls who are excessive talkers. These girls talk very fast and jump from topic to topic and often overwhelm their listener by doing so (Quinn, 2005). In school they will have trouble staying focused on the lesson at hand and will often distract others (Quinn, 2005). Girls with AD/HD Predominantly Inattentive Type may have trouble remembering simple requests, following directions, and can become overwhelmed with too much noise or activity (Quinn, 2005). Riccio, Homack, Jarratt, and Wolfe (2006) findings supported previous findings that children with AD/HD subtypes evidence somewhat lower achievement than expected. They found that children in both the predominantly inattentive and combined type groups evidenced similar attentional problems that affected their academic levels to the same extent (Riccio et al., 2006). Studies of national and community samples have suggested that one third to two thirds of children will continue to have hindering symptoms as adults (Kessler, Adler, Barkley, Biederman, Conners, & Faraone, 2005; Weiss, Worling, & Wasdell, 2003). These adults may show lessened hyperactivity but remain somewhat inattentive and impulsive. Hyperactivity in adults may take the form of hand tapping, leg shaking, and restlessness (Quinn, 2005). Inattention may be present in occupational, educational, and social situations. Impulsivity may be apparent in taking part of potentially dangerous activities without considering the consequences. In adulthood the symptoms of AD/HD may include: being easily overwhelmed by tasks of daily living, inconsistent work performance, feelings of anxiety and depression, difficulty establishing and maintaining

rules, inability to perform up to one's potential at school, low frustration tolerance, impatience, or difficulty thinking clearly (Barkley, 1998, Nadeau, 1995). Inattentive symptoms in women include disorganization, low self-esteem, forgetfulness, and anxiety (Quinn, 2005). A diagnosis of this disorder later in one's life is usually the case for those individuals with the Predominantly Inattentive Type. At times symptoms of inattention are frequently overlooked or misdiagnosed because of coexisting disorders and other conditions that may complicate obtaining an accurate diagnosis. Six or more of these symptoms of inattention must have persisted for at least six months to a degree that has been inconsistent and maladaptive with the individual's developmental level (APA, 2000). The DSM-IV-TR states that inattention may be manifested in academic, occupational, and even social situations. The predominantly inattentive subtype was described by Nigg, Goldsmith, and Sachek (2004) as characterized by inattention, disorganization, and possibly revealing problems with effortful control.

Some individuals may be diagnosed for the first time as adults when the demands at home or work become too difficult to manage. These women may have problems with multitasking, keeping up with the daily tasks of preparing meals and doing laundry, and they may struggle to keep up with accelerating stresses or difficulties of their jobs. With respect to age, academic problems appear to extend beyond childhood, being also of consequence to adolescents, college students, and adults who were diagnosed with AD/HD during childhood or for those individuals whose symptoms appeared later in life (Frazier, Youngstrom, Glutting, & Watkins, 2007).

AD/HD is a common disorder among children and adolescents; for the majority of children and youth affected with AD/HD, they will continue to evidence significant impairment in their adult years. Symptom criteria that are displayed by adults with AD/HD compared to non-diagnosed adults are problems with follow through, forgetting, organization, and losing things. Related to sense of time, adults with AD/HD displayed problems with meeting deadlines, not completing tasks, not planning ahead, and having a poorer sense of time significantly more frequently than adults in either the No-Diagnosis or other Clinical Disorder group. Difficulties in organization, including organizations of materials, time management, scheduling, and planning abilities are features discussed more frequently with AD/HD in adults. These deficits fit with a conceptualization of AD/HD as reflecting executive function deficits. It has been proposed that with increasing age, deficits in executive function become more salient relative to attentional problems (Conners & Jett, 1999). Adults rely more on executive function due to greater demands for self-sufficiency, responsible behavior, organization, social skills, planning and concern for the future as compared to children (Barkley, 1998a, Denckla, 1996). These differences in demands are not reflected in child-based criteria of DSM-IV. Research suggests that the most prominent symptoms of adults relate to inattention as opposed to excess motor movement and impulsivity; however, the diagnostic criteria and subtypes provided in the DSM-IV reflect the prevalent symptoms in children.

A review of AD/HD subtypes by Carlson, Shin and Booth (1999) stated that average boy-girl ratios in clinic based samples are 4.6:1 for AD/HD, combined subtype

and 2.7:1 for AD/HD, predominantly inattentive subtype. In nonreferred samples they are 3.4 :1 for the combined subtype and 2.4:1 for the inattentive subtype (Carlson et al., 1999). This study shows that the proportion of boys to girls is lower in the inattentive subtype than the combined subtype, especially for the nonreferred samples. This finding correlates with the results found in the DSM-IV field trials. These trials suggested that children with the predominantly inattentive type of AD/HD had unique demographic characteristics in regards to age, gender, and prevalence (Lahey et al., 1994).

Specifically, children with AD/HD, predominantly inattentive type were significantly older than those with the combined subtype (Lahey et al., 1994). Girls that were diagnosed with AD/HD were found to be most likely among the inattentive subtype, with the proportion of females among the AD/HD inattentive subtype (M:F of 2.7:1) in comparison to that among the combined subtype (7.4:1 Lahey, Applegate, & McBurnett, 1994). Finally, Lahey et al. (1994) found that although the inattentive subtype seems to be more prevalent in the population compared with other subtypes, its prevalence is substantially diminished among clinic samples. This indicates that children with the inattentive subtype are less likely than children with other subtypes of AD/HD to be referred or identified.

### *Gender Differences*

When researchers turned their focus from children with AD/HD to adults with the disorder, they began looking at gender differences in males and females with AD/HD. One of the imminent issues researchers wanted to address included why the diagnosis rates were greater among boys than girls. Ratey, Miller, and Nadeau (1995)

reported that girls are often referred for diagnosis at a later age and also that girls and women with AD/HD who have the Predominantly Inattentive subtype may be underreported and underdiagnosed. Biases in the referral of girls to be assessed for AD/HD may contribute to the underdiagnosis of girls who have the inattentive type of AD/HD and in the identification of the most behaviorally affected girls. The ratio of clinically referred boys and girls is also likely to be driven by a referral bias in that boys with AD/HD are more aggressive than girls with the disorder (Barkley, 1998). Gender differences that have been reported are that AD/HD girls tend to have higher rates of cognitive impairment, language dysfunction, reading difficulties, and neurological deficits (James & Taylor, 1990). Boys diagnosed with AD/HD are more likely to be aggressive and display antisocial behavior (Berry, Shaywitz, & Shaywitz, 1985). This difference may explain why AD/HD is much more commonly diagnosed in males while it is often a “hidden disorder” in girls and women (Quinn, 2005). The aggressive and defiant behavior common to boys with AD/HD may be influential in initiating referral for many boys, who become diagnosed with AD/HD (Barkley, 1996). Teacher and parent referrals usually describe obvious and more problematic male AD/HD behaviors, such as disruptiveness, interrupting others, and excessive talking. Results of several studies support the perception that gender differences are present in terms of the perceived severity of symptom expression as determined by teachers’ behavior ratings (Reid, et al., 2000; Reynolds & Kamphaus, 1992). The AD/HD symptoms of girls are often not the same as those of boys. For instance, hyperactivity is usually not diagnosed in girls. Girls are likely to internalize symptoms and become anxious, depressed, and

socially withdrawn (Quinn, 2005). Research concerning girls with AD/HD show that they are primarily inattentive, while boys with AD/HD are found to be typically more impulsive or hyperactive. Since symptoms in females such as disorganization, low self-esteem, forgetfulness, and anxiety are less overt than those disruptive behaviors found in males, they often may go unnoticed. Nigg, Blaskey, Huang-Pollack, and Rapapley (2002) supported differentiation of predominantly inattentive type and combined type, noting that differences may be subtle and vary by one's gender.

Despite the evidence supporting the identification of AD/HD in the adult populations, there continues to be little research in this areas. There is even less research investigating the gender differences in adults with AD/HD. Some research indicates that the gender difference in the expression of AD/HD is reduced to 1:1 by adulthood (Biederman et al., 1993; DuPaul et al., 2001; Rodriquez & Span, 2008). Studies conducted on women's psychosocial functioning report that there is some evidence that women with AD/HD struggle significantly with low self-esteem, depression, anxiety, and an external locus of control (Rucklidge & Kaplan, 1997). These women are found to also have a greater likelihood of having an internal-incontrollable attributional style and dissatisfaction with their childhood (Rucklidge & Kaplan, 2000). A study conducted recently by Rucklidge, Brown, Crawford, and Kaplan (2007) is the first research study to investigate the psychosocial functioning of both men and women with AD/HD symptomatology who were not diagnosed in childhood. Overall, they found that both genders report similar psychosocial difficulties, including self-esteem, varying levels of depression and anxiety, a relatively external locus of control, and a greater

dissatisfaction with childhood compared to controls. Thus, it is important to address the psychosocial functioning in both males and females. This study shows the role that a late diagnosis of AD/HD in adulthood may play in the development of psychosocial problems. Unidentified AD/HD can lead to misattributions of blame that may then lead to more psychosocial problems. Thus, the secondary problems that arise in individuals who receive a late diagnosis should be addressed regardless of gender. Importance should be placed in the consideration of AD/HD as a diagnosis in childhood so as to alleviate the possible longstanding psychosocial consequences of being misdiagnosed or receiving a late diagnosis.

#### *Comorbidity Differences by Gender*

Sometimes AD/HD symptoms are ignored or misdiagnosed because of the presence of other disorders in addition to AD/HD, otherwise known as comorbidity. The co-occurrence of AD/HD and a reading disability and the coexistence of AD/HD with disruptive disorders such as oppositional defiant disorder (ODD) and conduct disorder (CD) have been well established by researchers (Bird, Gould, & Staghezza-Jaramillo, 1990; Pliszka, Carlson, & Swanson, 1999). High rates of ODD and CD have been found to co-occur with AD/HD. Review of studies concluded that 30-50% of the children diagnosed with AD/HD also met the criteria for ODD or CD (Biederman, Newcorn, & Sprich, 1991). A study by Sharp and colleagues (1999) found girls and boys with AD/HD to have comparable rates of comorbid ODD (girls 50%, boys 33%) and CD (girls 2%, boys 7%). Another study found comparable rates of comorbid ODD among girls and boys with AD/HD. Among those children with AD/HD combined type, 62% of

the boys and 71% of the girls met criteria for ODD (Carlson, Tamm, & Gaub, 1997). Studies that have looked at subgroups of AD/HD have found that children with AD/HD and ODD and/or CD had more problems with peers, feelings of loneliness, poor social skills, and anxiety than children with AD/HD only or with other combinations of problems (Gresham, MacMillan, Bocian, Ward, & Forness, 1998; Kuhne, Schachar, & Tannock, 1997). In a study that explored whether AD/HD is a valid clinical entity in female subjects and whether it is expressed differently in male and female adults found that female AD/HD adults had significantly lower rates of conduct disorder (Biederman, et al., 1994). This finding is consistent with those reported in pediatric samples of girls with AD/HD (Safer & Krager, 1983) which found AD/HD girls to have a lower rate of conduct disorder than AD/HD boys. Biederman et al. (1994) also found that women with AD/HD had higher rates of major depression, anxiety disorders, and conduct disorder, and more evidence of school failure and cognitive impairment when compared with normal control females. Internalizing disorders such as anxiety disorders have also been found to be common among children with AD/HD (Jensen et al., 2001). It has been reported that forty percent of adults with AD/HD report having an anxiety disorder as well (Barkley, 1998; Tzelepis et al., 1995).

Researchers have examined whether co-occurring disorders influence AD/HD symptomatology. Having an anxiety disorder in addition to AD/HD has been found to be more commonly associated with inattentive symptoms than hyperactive/impulsive symptoms (Newcorn et al., 2001). Studies found that children with primarily inattentive features are more likely to have comorbid learning and internalizing disorders such as



mood or anxiety disorders (Eiraldi, Power, & Nezu, 1997; Lahey, Schaughency, & Hynd, 1987). In contrast, primarily hyperactive-impulsive and or combined AD/HD subtypes are more frequently associated with aggression and oppositional behavior (Eiraldi et al., 1997; Lahey et al., 1987). It was found that compared to children with only AD/HD or to children with AD/HD and anxiety, the children with coexisting ODD or CD were more impulsive (Newcorn et al., 2001).

Adults with AD/HD are at risk for alcohol and drug abuse as well as developing a psychiatric condition including substance abuse disorder, anxiety disorder, and antisocial behavior. Substance-related disorders, anxiety disorders, learning disabilities, mood disorders, and obsessive-compulsive disorder are just a few conditions that most frequently coexist with AD/HD (Tzelepis et al. 1995, Barkley, 1998). In a study of 56 adults with AD/HD, Shekim, Asarnow, Hess, and Zaucha (1990) found that 53 percent had a generalized anxiety disorder, 34 percent alcohol abuse or dependence, and 30 percent drug abuse, 25 percent dysthymic disorder, and 25 percent cyclothymic disorder. Shekim et al. (1990) reported that about one-third of adults with AD/HD have a coexisting Mood Disorder, which most often includes, Major Depressive Disorder, Dysthymia, and Cyclothymia.

AD/HD has been found to be a risk factor commonly associated as a predictor of problem drinking over the past twenty years (Smith, Molina, & Pelham, 2002; Weiss & Hechtman, 1993; Wilens, 1998; Rodriquez & Span, 2008). AD/HD seems to be overrepresented in the alcohol and drug abusing groups (Wilens et al., 1997). These individuals may be self-medicating the distress they feel arise due to academic and social

impairment commonly associated with the disorder. To date, there have been inconsistent findings when investigating AD/HD as a risk factor for alcohol use and abuse. In a recent study, Rodriguez et al. (2007) found that higher levels of AD/HD symptoms among a sample of college students was found to be associated with an increased chance of the students being involved in binge drinking. Barkley, Fischer, Mariellen, Smallish, and Fletcher (2006) and Span & Earlywine (2004) found that more severe symptoms of AD/HD are positively correlated with impairments in major life activities and drinking habits respectively (Rodriguez & Span, 2008). Another study found that AD/HD symptoms and poor response inhibition were related to adolescent problem drinking (Nigg, et al., 2006). On the other hand, Beiderman et al. (1997) and Weiss & Hechtman (1993) found no statistical difference in rates of alcohol use disorders and no differing rates of alcohol use between young adults with AD/HD and those without. An explanation for this difference may be that another variable may moderate the relationship between AD/HD symptoms and alcohol consumptions. Such variables may include hangover symptoms or limited access to alcohol.

It has become apparent that AD/HD is common among adolescents who have substance use disorder (SUD Szobot & Bukstein, 2008). Several studies have implied that AD/HD is a risk factor for SUD based on the overrepresentation of adolescents with AD/HD with substance use disorder and since AD/HD is already present years before individuals experiment with drugs (DeMilio, 1989; Horner & Scheibe, 1997; Szbot & Bukstein, 2008; Szbot, Rohde, & Bukstein, 2007). As mentioned previously, conduct disorder has been found to be highly prevalent among adolescents who have AD/HD

(Biederman, Newcorn, & Sprich, 1991; Pliszka, Carlson, & Swanson, 1999) and it is also a well-known risk factor for substance use disorder (Myers, Stewart, & Brown, 1998; Clark, Cornelius, & Kirisci, 2005; Biederman, Wilens, & Mick, 1997). Some evidence suggests that those individuals who have AD/HD and comorbid conduct disorder would be at a higher risk for substance use disorder (Szbot et al., 2008). It has been shown that children with AD/HD have dysfunction in the dopaminergic circuits, in the basal ganglia and frontal cortex of their brain (Seidman, Valera, & Makris, 2005). These dopaminergic system genes have been involved in AD/HD and drug problems (Cook, Stein, & Ellison, 1995; Robinson, 1993). Research has shown that dopamine-regulated areas such as the basal ganglia and frontal areas are affected in individuals who have AD/HD and substance use disorder (Volkow, Fowler, & Wang, 2004). Those individuals who have AD/HD have cognitive dysfunctions that may impair them in risky drug-use situations. Those with AD/HD may have a tendency to overestimate their competence and sustain in a behavior despite knowing its negative consequences (Gerdes, Hoza, & Pelham, 2003; Hoza, Gerdes, & Hinshaw, 2004; Nigg & Casey, 2005). For instance, if an adolescent with AD/HD understands that their drug use is creating negative consequences such as family problems, they may have a more difficult time changing their behavior because of their impaired cognitive flexibility (Szbot et al., 2008). Thus, the individual may choose the immediate but ultimately negative reward by self-medicating with drugs over the potential future gratification of family harmony. Impulsive behavior and choices are associated with drug use (Szbot et al., 2008). Research on substance use disorders shows that those individuals with substance use

disorders may decide on choices with immediate gains despite having higher future losses because of them (Bechara & Martin, 2004). Many individuals may be self-medicating their AD/HD symptoms with drug use. After drug experimentations, some individuals may feel or behave better, and this reinforces drug use (Szbot et al., 2008). For example, an acute use of nicotine, which has stimulant properties, is associated with an improvement in some cognitive functions (Weiss, Nosten-Bertrand, & McIntosh, 2007). Thus, it is not surprising that individuals who have AD/HD are at a higher risk for the regular use of nicotine (Kollins, McClernon, & Fuemmeler, 2005; Sartor & Lynskey, 2007). Since the onset of AD/HD is in childhood, at-risk children can be identified and monitored for early intervention to help prevent the onset of substance use disorder that generally initiates later in life.

Evidence has shown that individuals with AD/HD struggle in all domains of functioning including psychosocially (Rucklidge et al., 1997) and psychiatrically (Shekim, Asarnow, Hess, Zaucha, & Wheeler, 1990; in Rucklidge, Brown, Crawford, & Kalan, 2007). One issue that is important to address in the adult diagnosis of AD/HD, particularly in reference to their psychosocial functioning is the timing of the diagnosis (Rucklidge, Brown, Crawford, & Kaplan, 2007). Although there are many individuals who received their diagnosis as children, there is an overlooked population that was first identified with AD/HD in adulthood. The effect of a diagnosis of AD/HD later in life has clinical relevance. It is of particular importance to identify attributions of blame for the difficulties that come alongside a diagnosis of AD/HD without knowledge of the presence of the disorder. These attributions may be related to other areas of psychosocial

functioning such as self-esteem, depression, and anxiety (Flett, Blankstein, Occhiuto, & Koledin, 1994; Winefield, Tiggermann, & Winefield, 1992; in Rucklidge et. al., 2007). Whether a student attributes negative events to internal, stable, and global factors or not can effect their psychosocial functioning. Self-blame can be maladaptive or adaptive depending on where that blame was directed (Janoff-Bulman, 1979; in Rucklidge et. al., 2007). For instance, if an individual focuses blame on his or her ability, it is likely that it will affect his or her self-esteem. On the other hand, if the focus of the blame is directed onto his or her effort, the individual may be more likely to believe in his or her future control over the situation. In their study Rucklidge & Kaplan (2000) reported that women who were diagnosed in adulthood were more likely to have maladaptive attributional styles as compared to controls. This study also found that those individuals with undiagnosed AD/HD were likely to have a higher rate of repeated experiences with failure during childhood and in turn, these experiences could affect other areas of psychosocial functioning (Rucklidge et al., 2000).

The comorbid disorders in females are often different from those observed in males who have AD/HD. For example, comorbid disorders seen in males such as conduct disorder and oppositional defiant disorder are half as common among girls with AD/HD (Quinn, 2005). Concentration difficulties are a feature of many psychiatric disorders including mood and anxiety disorders (Biederman et al., 1994). Higher rates of anxiety, learning disabilities, and mood disorders are general disorders that often coexist with AD/HD in females (Quinn, 2005; Barkley, 1998; Biederman et al., 1993; Shekhir, 1997; Tzelepis et al., 1995; Wilens et al., 1997). In a study done by Ratey et al. (1995), it

was found that women with AD/HD may have higher rates of depression and anxiety which often misleads physicians away from a diagnosis of AD/HD. Since women may show signs of depression and anxiety, AD/HD may be confused with other disorders.

These comorbid disorders are often recognized and identified, while a diagnosis of AD/HD may not even be considered or may be missed because inattentive symptoms can not be identified as easily, especially in young children. Thus, it is important to distinguish whether or not the individuals' symptoms are a result of a comorbid condition or of a primary diagnosis. Because AD/HD in children and adults is frequently comorbid with these disorders (Biederman and Newcorn, 1990), clinicians should rule out the diagnosis of AD/HD when the other disorders are present. Regardless of the type of AD/HD diagnosis, research has consistently reported that students with AD/HD have a greater risk than other children for a range of academic complications, including a higher incidence of failing grades and higher rates of grade retention (Fergusson & Horwood, 1995; Fergusson, Lynskey, & Horwood, 1997). These students are also at risk for social, personal, and vocational outcomes (Barkley, 1998).

#### *Peer Interactions*

Children with the Predominantly Inattentive Subtype of AD/HD may be perceived as shy or withdrawn by peers. Aggressive behavior in children with symptoms of impulsivity/hyperactivity may play a role in peer rejection as well. Also, other behavioral disorders may often occur along with AD/HD. Individuals with AD/HD often experience social difficulties, social rejection, and interpersonal relationship problems as

a result of their inattention, impulsivity, and hyperactivity. Children with AD/HD and other disorders appear to face greater impairments in their relationships with their peers.

Organization is a challenge for many people but can be especially challenging for individuals with AD/HD. The characteristic traits of AD/HD, inattention and distractibility, make organization and management of time and money very difficult. Adults with AD/HD are often inattentive and forgetful and typically lack impulsive control. AD/HD is often referred to as an “invisible disability” because it is unrecognized by those unfamiliar with the disorder. AD/HD symptoms that result in socially inappropriate behaviors are often attributed to other causes by those individuals. They may consider the person to be rude, irresponsible, or lazy. These negative labels often lead to the social rejection of the individual with AD/HD. Social rejection may cause emotional pain in the lives of children and adults with AD/HD and can lead to lower self-esteem throughout the life span.

The DSM-IV-TR states that academic deficits and school related problems tend to be most pronounced in the subtypes of AD/HD marked by inattention (Predominantly Inattentive and Combined types). Researchers have continued to support the view that academic problems are linked to attention problems (Rabiner, Murray, Schmid, & Malone, 2004). Thus, these problems are likely to be present in both predominantly inattentive and combined type subtypes. The association with academic problems appears to be specific to AD/HD related behaviors and is not necessarily explained by comorbid conduct disorders (DuPaul, Power, Reid, McGoey, & Ikeda 1997; Rapport, Scanlan, & Denney, 1999; Riccio et al., 2006). Further, variability in intelligence levels

are found among children with AD/HD. For instance, symptoms of inattention are commonly found among children with a low IQ who are placed in academic settings that are inappropriate for their intellectual ability (APA, 2000). On the other hand, symptoms of inattention can also be found among children with a high IQ who are placed in academically understimulating environments. However, a diagnosis of AD/HD may be delayed if an individual has protective influences such as a high IQ, relatively good social skills, and no symptoms of a conduct disorder (Tzelepis, Schubiner, & Warbasse, 1995). For instance, an individual who has AD/HD and a higher IQ may be able to cope with symptoms and compensate academically, which can result in a later diagnosis. Ratey, Greenberg, Bemporad, and Lindem (1992) studied the characteristics of 60 adults with significant, but undiagnosed AD/HD. They concluded that the adults in the study had previously been undiagnosed due to their abilities to compensate for difficulties in previous years. Flach (1987) similarly suggested that it may be difficult to identify AD/HD in adults as they may develop compensatory skills or may learn to hide their deficits.

Another protective influence that may be conducive to a later diagnosis of AD/HD is having an exceptional family support system (Tzelepis et al., 1995). Signs of the disorder may be minimal or absent when the person is receiving frequent rewards for appropriate behavior, is under close supervision, is in a novel setting, is engaged in an interesting activity, or is in a one-to-one situation (APA, 2000). “The impact of AD/HD depends on what else you have going for you, such as intelligence, a congenial personality, or financial resources,” said Jerold F. Rosenbaum, psychiatrist in-chief at



Massachusetts General Hospital (Okie, 2006, p. 2640). Thus, some individuals who have these advantages can compensate for the disorder. Females are socialized differently, and thus, tend to express themselves in a different manner. Unlike disruptive hyperactive boys, girls with AD/HD are described as being people pleasers (Keltner & Taylor, 2002). These attempts to please others and fit in can create difficulty in attaining a proper diagnosis. In other words, girls may strive harder to compensate for their symptoms in order to meet parent expectations.

#### *Females and AD/HD*

Only recently has AD/HD been recognized to occur in adults (Barkley, 1998, Nadeau, 1995; Quinn, 1997; Goldstein, 1997; Sudderth & Kandel, 1997). Most of the studies on AD/HD in adults have focused on AD/HD Hyperactive/Impulsive Subtype and as a result these studies have few if any women in their samples. To date, the developmental course and adult outcome of males has been researched extensively while those of women with AD/HD have been neglected. There is a need for research on the clinical outcomes of women diagnosed with AD/HD. Thus, this research is focused on the self-esteem of women diagnosed with AD/HD.

Attention to females with AD/HD and gender differences has been overlooked until recently. With increased knowledge in the incidence and prevalence of AD/HD in the general population, chronic nature, and the importance as a public health concern in the adult populations, there is a need to research the developmental course and outcomes of AD/HD in women. Research that has been specifically focused on women with AD/HD has been relatively limited (Nadeau, 1995; Sudderth et al., 1997). Boys with

AD/HD seem to outnumber girls in childhood, but by adulthood the ratio of men to women is closer to equal (Sharp, 1997); however, men have been estimated to be 3 to 9 times more likely to have AD/HD than women (American Psychiatric Association, 1994). The range for male-female ratios is 9:1 to 6:1 in clinical samples and 3:1 in community-based populations (Gaub et al., 1997). It is important to note that this estimate may be the result of referral or male research bias.

Research shows that girls with AD/HD represent an under-identified group at-risk for long-term emotional, social, and academic problems (McGee & Feehan, 1991). It is often not until the onset of puberty and the combined demands of middle school that girls who have inattentive type AD/HD demonstrate some kind of impairment. These females with AD/HD may report low self-esteem, impaired social relationships, and a general demoralization (Quinn, 2005). Unfortunately, as children grow up, they are expected to be able to remain attentive to tasks for long periods of time even if they are described as being boring or effortful (Barkley, 2000). The older that they become, the more they should be able to do necessary but uninteresting tasks with little or no assistance. The problems associated with AD/HD have been identified to possibly continue into adolescence and adulthood among those who are affected (Sharp et al., 1999). Girls whose AD/HD symptoms have gone unnoticed or are misdiagnosed endure psychological and academic impairments; they often proceed through life without receiving the proper treatment for them.

A study conducted on women with AD/HD reported that those women who had been identified with AD/HD during childhood had greater rates of depression, anxiety,

and conduct disorder than women without AD/HD (Biederman et al., 1994). Nadeau (2002) said that girls with untreated AD/HD are at risk for chronic low self esteem, underachievement, anxiety, depression, teen pregnancy, and early smoking during middle and high school. Mannuzza and Klein (2000) indicated that deficits in self esteem and social skills associated with AD/HD in childhood appear to continue into adolescence and adulthood. As years pass by without a diagnosis, girls can develop secondary emotional problems, relationship difficulties, and feelings of underachievement (Mannuzza et al., 2000). Nadeau (2003) further explained that as adults these girls are at risk for divorce, single parenting a child with AD/HD, financial crisis, eating disorders, substance abuse, and constant stress due to having difficulty in managing the demands of daily life. In other words, without an accurate AD/HD diagnosis, girls who suffer from its symptoms in childhood may not get the help that they need in the areas of self-esteem and social skills to better adjust themselves to the societal demands that adolescence and adulthood bring. Results such as these suggest that neglecting to address AD/HD in women can have a serious negative impact on them. In a study looking at the psychological functioning of 51 women with AD/HD in adulthood, revealed that women with AD/HD were more depressed, anxious, and suffered from low self-esteem (Rucklidge et al., 1997). These women felt a sense of hopelessness before they were identified with AD/HD and also felt that a diagnosis of AD/HD was a positive experience in their life.

### *Treatment of AD/HD*

Most people think that treatment for the symptoms of AD/HD solely consists of medication. However, treatment strategies may include parent training, support groups, behavior management, and counseling as well as medication. Treatment can also be viewed as any activity that has a positive therapeutic effect on the individual. For some individuals, doing well in school, excelling in sports, participating in fun things with family or friends, or even having a positive relationship with a significant other can nontraditionally be considered treatment. The best treatment plan for an individual should be tailored to his or her individual needs and be designed to help him or her succeed at home, school, or work.

The ratio of men to women in treatment for AD/HD in childhood is 8:1 (Biederman et al., 1993; Rodriguez et al., 2008). Treating AD/HD in adulthood may often require addressing the psychosocial problems of these individuals. These individuals often have a long history of difficulties that they faced throughout their lives and are sometimes complicated either by a misdiagnosis or have the diagnosis go unrecognized for a long period of time. Treatment may consist of pharmacotherapy or combined psychotherapy. It may be helpful for individuals displaying AD/HD symptoms to receive attribution training, this type of training has been found to be effective with children with AD/HD (Reid & Borkowski, 1987; Rucklidge, Brown, Crawford, & Kaplan, 2007). The relevance of this type of training for adults with AD/HD is so that they may learn to develop a personal sense of control so that their feelings of helplessness are mitigated.

Medication is one part of a comprehensive treatment plan for those individuals with AD/HD. Three drugs, the non-stimulant atomoxetine (Strattera), mixed amphetamine salts (Adderall), and Dexmethylphenidate (Focalin) have been approved by the FDA for adult AD/HD (Okie, 2006). Methylphenidate (Ritalin) is the most commonly used stimulant medication (Quay, 1997; Kwasman, Tinsley, & Lepper, 1995 as cited in Riccio, Waldrop, Reynolds, & Lowe, 2001). For optimal results, some trial and error must be done with medication types and dosages. Most doctors start out with lower dosages and then gradually increase the medication dosage until the individual feels that the best results have been attained. As previously mentioned, AD/HD has a biochemical foundation. Thus medication is prescribed to enhance the functioning of neurotransmitters. All medications prescribed for AD/HD affect the production or absorption of these chemical messengers in the brain. These medications stimulate activity in the central nervous system, which can help them to concentrate better, improve impulse control, remember more information, complete work, and academic performance (Riccio et al., 2001; Brown, Borden, & Wynne, 1986). Ritalin has been found to be effective with approximately 70 to 80 percent of children with AD/HD (Dendy, 1995). A recent study examined the demographic trends in the use of medication for the treatment of AD/HD in adult and child populations (Castle, Aubert, Verbrugge, Khalid, & Epstein, 2007). Results of this study showed that in 2005, 4.4% of children (ages 0 to 19) and .8% of adults (ages 20 and older) used medications for AD/HD. Many people who were first prescribed stimulant medication when they were young children are continuing to take them during high school and in college. As one

would assume, treatment rates were higher in boys (6.1%) than in girls (2.6%), but the rates for men and women were approximately equal (0.8%). This may be indicative of the under-diagnosis of AD/HD in girls and the improved identification of the condition in adult females.

Behavior management or behavior modification is another intervention that is widely used for the treatment of AD/HD among children. Behavior management programs use techniques that include positive reinforcement; teaching the desired behavior; withholding rewards or privileges; and punishment to change a child's behavior (Dendy, 1995). A limitation of using this technique is that adolescents don't learn from rewards and punishments as easily as children. Behavioral programs that were effective during childhood tend not to work as well with teenagers (Dendy, 1995). Thus, as a child grows behavioral programs will need to be adjusted in order to meet their needs. Positive reinforcement and logical consequences with appropriate modifications can be used with older individuals.

Treatment approaches have primarily focused on medication and behavioral change intervention strategies. Although there have been a few studies addressing the effects of psychosocial approaches, they have typically excluded females. Nadeau and Quinn (2002) reported that current treatment trends for adult women tend to focus on psychoeducation and neurocognitive therapy. Medication is used to improve the individuals' cognitive functioning, while therapy is used to address coping strategies with an emphasis on developing effective tools to deal with AD/HD behavior patterns and helping the individual understand the problems associated with self blame (Quinn &

Nadeau, 2002). Three areas in which women with AD/HD experience dissatisfaction include performing and conforming to job expectations, identity, and fulfilling their role as a partner and/or mother (Quinn et al., 2002).

Counseling is another strategy that may be used in combination with other interventions as part of a complete treatment plan. AD/HD focused therapies that address issues including self-esteem, interpersonal and family issues, daily health habits, daily stress level, and life management skills are currently being developed. These interventions combine cognitive behavior therapy with cognitive rehabilitation techniques. Cognitive behavior therapy focuses on the psychological issues of AD/HD which would address self-esteem, self acceptance, self-blame. The cognitive rehabilitation approach focuses on life management skills for improving cognitive functions, learning compensatory strategies and restructuring the environment (Nadeau, 2002). In addition to counseling for the individual with AD/HD, counseling can be an intervention option for family members. Parents of children with AD/HD may benefit from attending educational and support groups provided by mental health facilities, churches, schools, and organizations such as Children and Adults with Attention Deficit/Hyperactivity Disorder (CHADD) and Attention Deficit Disorder Association (ADDA).

Studies suggest that individuals with untreated AD/HD symptoms of inattention, impulsiveness, and hyperactivity can impede school and work performance, damage self-esteem, interfere with relationships, and increase risks in the use of tobacco, substance abuse, and other psychiatric disorders (McCann & Roy-Burne, 2004).

Children with AD/HD may be perceived negatively by parents' and teachers. Because of the stigma that is sometimes associated with the diagnostic label and the accompanying treatments. These negative perceptions may have serious consequences which may include lower self-esteem, increased feelings of hopelessness and isolation, and a reduced likelihood of seeking and obtaining care (Eisenberg & Schneider, 2007). This study found that AD/HD diagnosed girls received more negative perceptions from parents and teachers even after they adjusted for standardized assessment scores, perceptions of externalizing behavior, and other variables.

#### *Self Esteem and AD/HD*

Self-esteem is commonly defined as reflecting the positivity of a person's self evaluation and as an evaluation it contains both cognitive and affective elements that can in turn influence one's thoughts as well as one's mood (Baumeister, 1998). One negative effect of AD/HD may be lower levels of self-esteem (Donnelly, 1989; Kelly, Cohen, Walker, Caskey, & Atkinson, 1989; Weiss, Hechtman, & Perlman, 1978). Studies of children have documented high self-esteem to be related to adaptive behaviors such as seeking assistance when needed and persistence in the face of initial failure (Brooks, 1994). Higher levels of self-esteem have also been associated with more competent functioning in the face of adversity (Radke-Yarrow & Sherman, 1990; Seifer, Sameroff, Baldwin, & Baldwin, 1992). A study of girls and boys identified as having aggressiveness/conduct problems found higher self-esteem to be predictive of more adaptive functioning (August, Realmuto, MacDonald, & Nugent, 1996). Higher self-esteem is also associated with greater academic achievement, more positive peer



relations, and lower levels of depression (Frankel & Myatt, 1996; Renouf & Harter, 1990; Skaalvik & Hagtvet, 1990). A study of children with a learning disability found that while initial self-esteem scores predicted gains in achievement, initial achievement did not predict improvements in self-esteem (Kershner, 1990). Lower self-esteem was associated with worse psychological functioning and eventually, difficulties in adulthood with educational and occupational achievement. Recent research shows that women with AD/HD often have more negative self-images than men with AD/HD (Arcia & Conners, 1998). Jerold F. Rosenbaum stated that “life is especially hard on those individuals who do not know that they have AD/HD because they feel so bad about themselves and they spend their lives apologizing” (Okie, 2006, p. 2640).

If it is likely that higher self-esteem may lead to more adaptive functioning, efforts to improve an individual’s self-esteem is important. Current research on the self-esteem of children with AD/HD is limited. The studies that have been conducted on the self-esteem of boys with AD/HD have presented conflicting results. The studies that have included girls have small female samples, and/or have not reported separate results for boys and girls. A study by Kuhne, Schachar, and Tannock (1997), using the Self Perception Profile for Children (SPPC) failed to find group differences in the global self-esteem among AD/HD-only, AHDH + ODD, and AD/HD + CD children, ages 5-12. This study did not include a control group and there were few girls in their sample (5 in the AD/HD only group, 12 in the AD/HD + ODD, and 0 in the AD/HD + CD group). Another study of children, grades 3 and 4, did not find any group differences in the global self-esteem and social self-concept among children defined as hyperactive with

externalizing problems, children with both internalizing and externalizing problems, and comparisons. This study found that the two clinical groups reported lower academic self-concept than the comparison children (Gresham, MacMillan, Bocian, Ward, & Forness, 1998). Although the study included girls, it was unclear how many girls were in each diagnostic group. Also, results from the study were not broken down by gender.

Evidence has shown that individuals with AD/HD continue to struggle in all domains of functioning, including psychosocially (Rucklidge et al., 1997) and psychiatrically (Shekim, Asarnow, Hess, Zaucha, & Wheeler, 1990). There is also some indication from research with children and adolescents that females are often as impaired or even more impaired than males with AD/HD (Disney, Elkins, McGue & Iacano, 1999; Rucklidge & Tannock, 2001; in Rucklidge, Brown, Crawford, & Kaplan, 2007). Recent research shows that women with AD/HD often have more negative self-images than men with AD/HD (Arcia & Conners, 1998). The timing of an individual's diagnosis is an issue that is pertinent with respect to their psychological functioning. One study reported that women who were diagnosed with AD/HD in adulthood are more likely to have maladaptive attributional styles as compared with controls (Rucklidge & Kaplan, 2000). These maladaptive attributional styles may be related to other areas of psychosocial functioning, such as self-esteem, depression, and anxiety (Flett, Blankstein, Occhiuto, & Koledin, 1994; Winefield, Tiggemann, & Winefield, 1992; in Rucklidge, Brown, Crawford, & Kaplan, 2007). Thus, it is important to be cognizant of internalizing issues that may be present in women who have AD/HD.

## CHAPTER III

### METHOD

#### *Design*

This study used a correlational research design. The correlation coefficient was the appropriate descriptive statistic to use since this study aimed to determine the strength of the relationship between two variables (Hinkle, Wiersma, & Jurs, 2003). The correlation coefficient was computed by using raw score or z-score data. Advantages of doing such a study include being able to observe a large number of variables in one study and that correlation coefficients provide a measure and degree of relationship between variables. Once the correlation was determined for the sample its statistical significance was determined.

This study also utilized the concept of prediction. Prediction involves estimating a score on one variable, which is known to be the criterion variable, from knowledge of scores on another variable (Hinkle et al., 2003). The first step of prediction involves determining the regression line, which is a mathematical equation ( $\hat{Y} = bX + a$ ). In this equation, " $\hat{Y}$ " is the predicted score, " $b$ " is the slope of the line and also called the regression coefficient, while " $a$ " is the Y intercept and is also called the regression constant. Then the mathematical equation is used to predict scores. In regression, the larger that the correlation between the variables X and Y is, the smaller the standard error of estimate and the greater the accuracy of prediction will be (Hinkle et al., 2003). A multiple regression approach was used when there was one criterion variable (e.g. self

esteem) and multiple predictor variables (e.g. emotional support and communication). The predictor variables were combined into an equation ( $\hat{Y} = b_1X_1 + b_2X_2 \dots + b_kX_k + a$ ) that can be used to predict scores on the criterion variable ( $\hat{Y}$ ) from scores on the predictor variables ( $X_i$ 's; Hinkle et al., 2003). In this equation the “b’s” are the regression coefficients for the predictor variables and “a” is the regression constant.

### *Research Questions*

Question 1- What is the relationship of AD/HD with the self esteem of college women? It was hypothesized that there would be a negative relationship. As AD/HD symptoms increase self- esteem will decrease. This question was answered by comparing scores from the AD/HD scale and the self esteem inventory.

Question 2- What is the relationship between a childhood diagnosis of AD/HD compared to adolescent or adult diagnosis of AD/HD and the self-esteem of college women? It was hypothesized that that there would be a negative relationship; as age of diagnosis increases, self- esteem will decrease. This question was answered by evaluating the correlations between women with a childhood diagnoses and their self esteem compared to the self- esteem of women who have had a diagnoses of AD/HD later in their lives. Those students who participated in the study who did not have a prior diagnosis of AD/HD, but did show significant levels of inattention, hyperactivity or impulsivity on the AD/HD scale were also included in this comparison. The correlation between their self- esteem and scores on the AD/HD scale were examined among those women diagnosed with AD/HD and those that show significant levels inattention, hyperactivity or impulsivity on the AD/HD scale.

Question 3- Does moving away from family and existing social networks have a relationship with the self-esteem of college women with AD/HD? Studies have shown that a strong familial support system can be beneficial to women with AD/HD. In the situation when an individual has AD/HD, it was determined if familial support acted as a buffer and was a moderator variable for self-esteem. It was hypothesized that there would be a positive relationship; the closer contact they have with their family (strong familial support systems) and social networks, the higher their self-esteem will be. The self-esteem levels as determined by the inventory were examined of the women attending the different post secondary institutions.

Question 4-What is the relationship between the types of postsecondary institution on the self-esteem of college women with AD/HD? It was hypothesized that there would be a negative relationship; the smaller the postsecondary institution, the higher the self-esteem of the student. It was hypothesized that women who attend Blinn College and present significant levels of AD/HD symptoms according to the AD/HD scale, but were not currently diagnosed with this disorder will have the highest self-esteem when compared to those women with an AD/HD diagnosis or who show AD/HD symptoms and are currently attending Texas A&M University. The self-esteem levels of women who attended the two different types of colleges were examined to see whether the size of the institution has a relationship with AD/HD and self-esteem.

### *Participants*

This study used a sample of college women attending public postsecondary institutions in Texas. The sample included students with and without a diagnosis of

AD/HD from each institution. The institutions that were included in the study are Blinn College (Bryan campus), Texas A&M University, University of Houston, and Houston Community College. Approval from each institution was acquired. Texas A&M University and the University of Houston are large four-year universities that provide education to 40,000 or more students, while Blinn College (Bryan campus) and the Houston Community College (Gulfton location) are two-year junior colleges, with an enrollment of about 14,000 and students respectively. About 300 students are served at Blinn with 65-70% having AD/HD. Approximately 666 students were served at the Disability Services office at A&M and out of those students 262 had AD/HD. Although exact numbers were not provided by the University of Houston and Houston Community College Disability Services offices, it was expected that services are offered to a similar amount of students.

Undergraduate students with AD/HD and receiving disability services and accommodations were recruited through their postsecondary institutions' Disability Services Provide. Flyers concerning the study were posted in each of the Disability Service Offices and were available for all female students to take home. Students were given the incentive of having their names entered into a drawing to win \$200 if they chose to participate in the study. One student from the participating postsecondary institutions was randomly selected to receive the prize money. Students recruited from the Disability Services Offices of each postsecondary institution also received a \$2-3 gift card to either McDonald's or Cold Stone Ice Creamery upon participating in this study. This study included all three subtypes of the disorder including women with the

Predominantly Inattentive subtype of AD/HD, those women with the Hyperactive/Impulsive subtype, and those with the Combined subtype of AD/HD. Only those students who were between the ages of 18-24 were allowed to participate in this study. Students with other comorbid disorders such as Generalized Anxiety Disorder or Major Depressive Disorder were allowed to participate in the study.

Undergraduate students who do not have a diagnosis of AD/HD or receive disability services were recruited by flyers posted on bulletin boards in their postsecondary institutions. Students organizations (i.e. Indian Students Association) at each postsecondary institution were asked to have flyers available at their meetings for interested students to take home.

### *Instruments*

*Conner's Adult AD/HD Rating Scale* (CAARS; Conners, Erhardt, & Sparrow, 1997). Each participant completed the Conner's Adult AD/HD Rating Scale (CAARS)-screening version to assess whether or not they currently have AD/HD symptoms. The CAARS-screening version is a 30 item scale that is designed to assist in the diagnosis of AD/HD in adults age 18 and above. Through Likert scale ratings, the respondent rated behaviors or problems in functioning on a 4 point scale ranging from Not at all, never to Very much, very frequently. T-scores <40 are found to be low, scores between 40-59 are average, while scores between 60-69 are elevated, and scores  $\geq 70$  are very elevated. The CAARS-screening version has rating criteria contained in the DSM-IV for AD/HD and also includes an AD/HD index. This index was developed to distinguish between an AD/HD clinical sample and a non-clinical sample by identifying adults who are likely to

be diagnosed with AD/HD. Studies suggest that the CAARS represents a reliable and valid measure of current AD/HD symptoms in adults (Erhardt et al., 1997). The total sample internal consistency for the Self-Report measures has reliability coefficients ranging from .66 to .90.

*The Multidimensional Self Esteem Inventory* (O'Brien & Epstein, 1988). Each participant in the study also completed the Multidimensional Self Esteem Inventory. This questionnaire provides measures of the components of self perception and self approval. It measures an individuals' self perception in eight aspects: 1) competence, 2) likeability, 3) lovability, 4) body appearance, 5) self control, 6) personal power, 7) moral self approval, and 8) body functioning. This inventory contains 116 items and may take approximately 40 minutes to complete. The first section presents 61 items written as self-descriptions. Respondents used a 5 point Likert scale (1= Completely false to 5= Completely True) to assess the descriptions. The second section has 55 items regarding thoughts experienced and feelings reflected. The respondents used a 5 point Likert scale (1=Almost never to 5= Very often) to report their experiences and reflections. T-scores between 40-59 indicate self-esteem to be in the normal range, those scores between 30-39 are low, scores that are 29 or lower indicate very low self-esteem, scores between 60-69 indicate high self-esteem, and those scores 70 or higher indicate very high self-esteem. This study will focus on an individual's global self-esteem (GSE), lovability (LVE), likability (LKE), self-control (SFC), and moral self-approval (MOR). The GSE scale indicates whether or not the individual is pleased with him/her self, feels significant as a person, is self-confident, is pleased with the past, and whether he or she



expects future successes. The LVE scale looks into whether or not the individual feels worth of love feels cared for by loved ones, feels accepted as a person, feels that he or she can count on support from loved ones, is able to express and receive feelings of love, and is involved in satisfying intimate relationships. The LKE scale notes whether or not the individual perceives him/her self as being likable and popular, is accepted by peers, is an enjoyable companion, gets along well with others, is popular in dating situations, expects to be liked, and makes a good first impression. The SFC scale observes whether the individual is self-disciplined, persevering, is good at setting and achieving goals, is not easily distracted, is in control of emotions, and exercises restraint in eating, drinking, and/or use of drugs. The MOR scale is used to determine whether the individual is pleased with moral values and behavior, has clearly defined moral standards and acts in a way that is consistent with moral values, and whether he or she sets a positive moral example for others. Test-retest reliability has been shown to be stable at approximately .80 or greater over a one month period of time (O'Brien & Epstein, 1989). The MSEI has shown excellent internal consistency and reliability coefficients which range from a low of .78 to a high of .90. The inventory includes a validity scale (Defensive Self-Enhancement) that measures the degree to which a person is defensively inflating his or her self-presentation (O'Brien & Epstein, 1989).

#### *Demographic Questionnaire*

All subjects completed a short demographic questionnaire concerning age, ethnicity, postsecondary institution, self-reported Grade Point Average (GPA), whether or not they commute (from their permanent address) to and from college, initial AD/HD

diagnosis, and whether medication has been taken in the past or is currently being taken for relief of AD/HD symptoms and if so, what type of medication has or is being taken (Appendix A).

### *Procedure*

IRB approval and permission to access students through the postsecondary institutions' Disability Services Provider were obtained. Informed consent forms were signed by each participant before she was included as a part of the study (Appendix B). The primary investigator or the co-investigator administered the AD/HD scale as a screening instrument to assess current symptoms of AD/HD and the self-esteem inventory to determine the students' current level of self-esteem to all participating students without AD/HD. The Disability Services director gave the inventories to each participating student with AD/HD in order to maintain confidentiality of their diagnosis. The demographic information sheet was also administered to each student. All students were asked to first complete the demographic questionnaire and then to control for order effects, students were asked to complete each successive scale including, the AD/HD scale and the self-esteem questionnaire in the order in which they preferred to complete them. Students were administered these instruments at their postsecondary institution beginning in the Spring semester of 2007 or the Summer semester of 2007. Participation in this study was voluntary. The instruments and the demographic form took approximately one hour or less to complete. Once all of the forms were completed, the information gathered was coded. This information was reported in aggregate (group) format to ensure the confidentiality of all participating students.

## CHAPTER IV

### RESULTS

#### *Data Analytic Plan*

The sample was categorized into two groups based on AD/HD diagnostic status. There were 50 participants in this study who did not have AD/HD and 24 participants who had a diagnosis of AD/HD. Chi-squares compared differences in categorical variables, such as ethnicity, school attending, and class year. For the continuous variables, ANOVAs were conducted, with AD/HD diagnostic status (yes/no) serving as a between-subjects factor. The AD/HD diagnosed group and the non-diagnosed group were combined in order to broaden the range of AD/HD scores.

#### *Demographics*

Three cases were removed from analyses because the participants did not meet the age requirements of this study. Demographic information for the 74 women used in analysis is presented in Table 1. The average age of the participants was 20 years old. While there were no age differences by diagnostic status, there were differences in class year. The majority of the AD/HD group was in their sophomore or junior year, whereas the non-diagnosed group was evenly distributed across class standing. There were also significant differences in GPA, with the non-diagnosed women having a higher GPA (3.28) than the women diagnosed with AD/HD. Examination by race revealed group differences on ethnicity. Women in the AD/HD sample were primarily Caucasian (91.7%), whereas the majority of women in the control sample were of Asian decent

(48%). However, examining Asian and Caucasian women within the comparison group revealed few demographic differences. There were no differences age, GPA or class rank,  $F(3,35) = 1.02$ , ns) comparing Asian versus Caucasian controls. There were also no differences in housing arrangements, communication with family or emotional support from family, or other mental health diagnoses comparing Asian and Caucasians in the control group. Rather they differed only in the college that they were attending. The majority of Asians were recruited from the University of Houston (50%), whereas the Caucasians were recruited from Texas A&M (67%).

The two groups also differed in terms of the postsecondary school which they were attending. The majority of women in the both the AD/HD and comparison groups were recruited from Texas A&M University, 54% and 44% respectively. Women also differed in terms of housing, with the non-diagnosed women being more likely to be living with their parents as compared to the women diagnosed with AD/HD.

Within the diagnosed group, the majority of the women, 22 in total, had received only the diagnosis of AD/HD and therefore, were not comorbid for other psychiatric disorders, however, one woman was dually-diagnosed with Major Depressive Disorder and another with Generalized Anxiety Disorder. Of the 24 women in the sample, 20 had been prescribed some kind of medication for AD/HD. The vast majority was prescribed and was currently taking medications (mostly Adderall) for their AD/HD symptoms. Only one of the 20 women was no longer taking her prescribed medications.

Table 1

*Demographics by Group.*

Variable	Diagnosed		Comparison		<i>F</i> (1,72) or  <i>X</i> <sup>2</sup> ( <i>N</i> = 74)
	AD/HD Group		Group		
	<u>(n = 24)</u>		<u>(n = 50)</u>		
	Mean	SD	Mean	SD	
		%		%	
Age:	20.45	(1.72)	20.21	(1.73)	0.35
GPA	3.02	(0.52)	3.28	(0.43)	5.32*
School					17.83**
Texas A&M	54%		44%		
Blinn	33%		18%		
Univ of Houston	0%		38%		
HCC	12.5%		0%		
Ethnicity					24.88**
Caucasian	91.7%		30%		
Hispanic	0%		20%		
Asian	8.3%		48%		
Other	0%		2%		

Table 1 (continued)

Variable	Diagnosed	Comparison	$\chi^2 (N = 74)$
	AD/HD Group	Group	
	<u>(<math>n = 24</math>)</u>	<u>(<math>n = 50</math>)</u>	
	%	%	
Class standing			10.32*
Freshman	8.3%	28%	
Sophomore	41.7%	24%	
Junior	41.7%	20%	
Senior	8.3%	28%	

Notes: \*  $p < .05$ ; \*\*  $p < .01$

*School Perceptions*

Women with and without a diagnosis of AD/HD revealed some differences in their perceptions about school work. A MANOVA comparing the two groups revealed overall differences in school perceptions as defined by interest in academic tasks, motivation to work hard, and satisfaction with their learning style, omnibus  $F(3,65) = 5.54$ ,  $p < .01$ . Examination of the univariate  $F$  statistics reveal that while the two groups do not differ on motivation to work hard ( $F(1,67) = 0.39$ , ns), the women with AD/HD report significantly less satisfaction with their own learning style ( $F(1,67) = 15.11$ ,  $p < .001$ ), and tend to report less interest in their academic tasks, ( $F(1,67) = 3.25$ ,  $p < .10$ ) as compared to women not diagnosed with AD/HD. Thus, while there were some differences between diagnosed and non-diagnosed women in school perception, women diagnosed with AD/HD were equally motivated to work hard in their academic studies as women in the control group.

*AD/HD Scores by AD/HD Diagnosis*

As expected, women who were receiving support services for AD/HD scored higher than the comparison sample on all scales measuring AD/HD symptoms. Diagnosed women scored significantly higher on Inattention symptoms, Hyperactive/Impulsive symptoms, AD/HD total and index scores. This information is shown in Table 2. Using cut-off categories based on T scores, women in the diagnosed group were more likely to score in the clinical range (one or more standard deviations above the mean) on all of the AD/HD scales than the comparison group. Note that while the diagnosed group scored higher than the comparison groups, six of the women in the comparison group scored one or more standard deviations above the mean on the AD/HD total score and the AD/HD index score. Thus, six women in the comparison group may meet criteria for AD/HD despite never having been diagnosed with the disorder.



Table 2

*AD/HD Symptoms T Scores by Group.*

Variable	Diagnosed			Comparison			<i>F</i> (1,72)
	AD/HD Group			Group			
	<u>(<i>n</i> = 24)</u>			<u>(<i>n</i> = 50)</u>			
	Mean	<i>SD</i>	% T	Mean	<i>SD</i>	% T	
			>60			>60	
Inattentive	65.63	(12.65)	62.5%	51.88	(9.89)	28%	26.04***
Hyperactive/Impulsive	54.92	(11.49)	37.5%	47.60	(8.66)	6%	9.31**
AD/HD Total Score	62.33	(12.13)	54.2%	50.18	(9.37)	12%	22.44***
AD/HD Index Score	58.13	(11.52)	50%	50.42	(8.27)	12%	10.83**

*Notes:* *T* scores mean = 50; *SD* = 10. Omnibus  $F(4,69) = 7.37, p < .001$

\*\*  $p < .01$ ; \*\*\*  $p < .001$ ;

*Self-esteem by AD/HD*

The two groups did not differ on any of the self-esteem subscales. This information is presented in Table 3. They also did not differ on family communication frequency or emotional support. Correlations were run within the AD/HD group examining the relation between age of diagnosis and self-esteem. Although it was predicted that age of diagnosis would be related to self-esteem (Research Question #2), there were no significant correlations between age of women when they were first diagnosed with AD/HD and current self-esteem. See Table 4 for the presentation of this information. However, AD/HD symptoms were negatively related to self-esteem, as predicted (Research Question #1, see Table 5). When correlations were examined across the entire sample, AD/HD inattentive symptoms were highly negatively related to global self-esteem, self-control, moral self-approval, body appearance, and body function. Hyperactive/ impulsive symptoms of AD/HD were negatively related to self-control and moral self-approval only. The AD/HD total score was negatively related to global self-esteem, self-control, moral self-approval, and competence, but was unrelated to likability, lovability, personal power, or body appearance or functioning. The AD/HD index score appears to be the best predictor of low self-esteem, as it was strongly negatively correlated to all nine of the self-esteem subscales.

Table 3

*Self-Esteem Scores by Group.*

Variable	Diagnosed		Comparison		<i>F</i> (1,72)
	AD/HD Group		Group		
	<u>(n = 24)</u>		<u>(n = 50)</u>		
	Mean	SD	Mean	SD	
Global Self-Esteem	30.04	(9.62)	33.34	(6.36)	3.09
Likability	33.08	(5.48)	34.54	(6.25)	0.95
Lovability	37.96	(8.22)	36.50	(6.59)	0.68
Self-Control	34.00	(6.74)	34.10	(6.83)	0.04
Moral Self-Approval	39.21	(7.56)	39.32	(7.39)	0.04

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Notes: Omnibus  $F(5,68) = 1.77$ , ns. No univariate  $F$  tests are significant at  $p < .05$ .

Table 4

*Correlations between Age of AD/HD Diagnosis and Self-Esteem within the Diagnosed Group.*

	Global Self-Esteem Score	Likability	Lovability	Self-Control	Moral Self-Approval
Age Diagnosed With AD/HD	.11	.04	.05	.26	.15

Notes: One-tail Pearson correlations.  $N = 24$ . No correlations are significant at  $p < .05$ .

Table 5

*Correlations between AD/HD Symptoms and Self Esteem Across Entire Sample.*

	Inattentive Symptoms	Hyperactive/Impul sive Symptoms	AD/HD Total Score	AD/HD Index Score
Global Self-Esteem Score	-.36*	-.18	-.31*	-.51***
Likability	-.22*	-.08	-.17	-.28**
Lovability	-.19	-.14	-.18	-.32**
Self-Control	-.43***	-.22*	-.37**	-.46***
Moral Self-Approval	-.27*	-.29**	-.30**	-.43***
Competence	-.37**	-.18	-.31**	-.42***
Personal Power	-.13	.12	-.02	-.20*
Body Appearance	-.22*	-.09	-.18	-.35**
Body Functioning	-.21*	-.09	-.17	-.34**

Notes: One-tail Pearson correlations.  $N = 74$ .

\* $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ .

### *Self-esteem and Family Support*

To address Research Question #3, the differential impact of family support on self-esteem as a function of AD/HD symptoms was examined. First, across the entire sample, emotional support from the family was positively related to global self-esteem, likability, lovability, and self-control but not to moral self-approval (see Table 6). Communication with the family was related only to lovability,  $r = .38, p < .001$ . The two family support variables (communication and emotional support) were summed to increase the range and variability of the measure. None of the family support variables were correlated with AD/HD symptoms (see Table 6). However, because family support was related to self-esteem, family support was examined as a moderator of the relation between self-esteem and AD/HD. It was predicted that in conditions of low family support, that the relation between self-esteem would be stronger than in conditions of high family support (Research Question #3). Family support was tested as a moderator using a multiple regression approach (Aiken & West, 1991; Baron & Kenny, 1986).

According to Baron and Kenny (1986), a moderator is a variable that “affects the direction and/or strength of the relation between an independent or predictor variable and a dependent or criterion variable.” The present study examined the possible moderator effects of family support in relation to AD/HD symptoms (independent variable) and self-esteem symptoms (dependent variable). Moderator effects are indicated by testing for significant effects in the interaction term (Baron & Kenny, 1986), in this case a significant interaction between AD/HD index scores and family

support in predicting global self-esteem. A Moderated Multiple Regression (Aiken & West, 1991) was conducted to test whether family support moderated the impact of AD/HD on self-esteem. In order to examine whether family support is a moderator several steps were taken. First, all variables were centered by subtracting the mean of each variable. Next, an interaction term was created to test for an interaction or moderator by multiplying the centered AD/HD index scale by the centered family support scale (emotional support plus communication with family). An interaction term is one variable multiplied by another; also known as a cross-product. If the interaction term is significant then a moderator is found. Finally, a stepwise multiple regression was conducted, entering AD/HD index score, then family support, and finally the interaction between AD/HD index score and family support to predict self-esteem.

It was predicted that there would a significant interaction between each family support and AD/HD symptoms in predicting self-esteem. Results of the multiple regressions reveal that while both family support and AD/HD index scores predicted global self-esteem, the interaction between family support and AD/HD was not significant. Therefore, family support does not appear to moderate the relation between AD/HD and self-esteem (see Table 7).

Table 6

*Correlations between Family Support, Self-Esteem and AD/HD Symptoms Across Entire Sample.*

Variable	Emotional Support From Family	Communication with Family	Total Family Support
<b>Self-Esteem</b>			
Global Self-Esteem Score	.25*	.16	.26*
Likability	.21*	.19	.26*
Lovability	.39***	.38***	.49*
Self-Control	.22*	.06	.19
Moral Self-Approval	.17	.16	.21*
<b>AD/HD</b>			
Inattentive Symptoms	-.07	-.08	-.09
Hyperactive/Impulsive Symptoms	-.04	-.01	-.03
AD/HD Total Score	-.06	-.06	-.08
AD/HD Index Score	-.15	.01	-.10

Notes: One-tail Pearson correlations.  $N = 74$ .

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ .



Table 7

*Multiple Regression Testing Family Support as a Moderator of the Relation between AD/HD and Self-Esteem.*

	B	SE B	Beta
AD/HD Index	-0.39	0.08	.51***
Family Support	2.21	1.00	-.22*
AD/HD X Family Support	0.73	0.11	.07

Note:  $R^2 = .31$ ;  $F$  change (1,70) = 10.31,  $p < .001$ .

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

*School Size by Self-esteem and AD/HD*

Research Question #4 hypothesizes that women with AD/HD symptoms will have higher self-esteem when they are attending smaller colleges as compared to women attending larger colleges. To address this question, a one-way MANOVA was conducted entering the five self-esteem scores as dependent variables and School (Texas A&M, Blinn, University of Houston, and HCC) as the independent variable. Means and standard deviations and F-statistics of this MANOVA comparing self-esteem scores by college attending are displayed in Table 8. Overall, there were no significant differences in self-esteem between women attending different colleges. Note, only three women were attending Houston Community College. This is an insufficient sample size to conduct an analyses of variance, so these three cases were excluded from these analyses. All of the nineteen women recruited from the University of Houston were in the comparison sample (not diagnosed with AD/HD).

A second 2-way MANOVA was conducted entering the five self-esteem scores as dependent variables and School (Texas A&M, Blinn) and AD/HD diagnostic status (yes/no) as two independent variables. Because there were no students diagnosed with AD/HD and receiving support services at University of Houston, no comparisons could be made between diagnosed and comparison women within this college.

Thus, women diagnosed and not diagnosed with AD/HD attending either Texas A&M and Blinn were compared to test the effect due to school size and diagnosis on self-esteem. Means and standard deviations and F-statistics of this MANOVA are displayed in Table 9. Results show a significant interaction between college and AD/HD diagnosis in predicting all of the self-esteem scores. Figure 1 displays these interactions graphically, using global self-esteem as the exemplar variable. While global self-esteem scores did not differ between women diagnosed with AD/HD or not at Texas A&M, there were differences between the two groups attending Blinn College. At Blinn College, women diagnosed with AD/HD were significantly lower on self-esteem than the comparison group of non-diagnosed women attending Blinn. Thus, although it was predicted that women diagnosed with AD/HD who were attending smaller schools would have higher self-esteem than those diagnosed with AD/HD and attending larger schools, the reverse appears to be true.

Table 8

*Self-Esteem Scores by College Attending.*

	Texas A&M		Blinn		UH		HCC		
	<u>(n = 35)</u>		<u>(n = 17)</u>		<u>(n = 19)</u>		<u>(n = 3)</u>		
Variable	Mean	SD	Mean	SD	Mean	SD	Mean	SD	F(1,72)
Global	32.91	(8.71)	30.18	(8.78)	33.00	(4.53)	32.00	(2.00)	0.55
Self-esteem									
Likability	33.63	(6.74)	33.53	(6.16)	33.32	(4.81)	34.33	(4.04)	0.37
Lovability	37.29	(8.02)	38.00	(6.75)	35.63	(6.29)	36.00	(3.46)	0.37
Self-control	34.00	(6.51)	35.88	(7.00)	32.63	(7.16)	29.00	(1.73)	1.30
Moral Self-approval	39.46	(7.80)	40.35	(8.54)	38.32	(6.16)	37.33	(3.22)	0.29

Note: Omnibus  $F(15,204) = 0.92$ , *ns*. No  $F$  statistic is significant a  $p < .05$

Table 9

*Self-Esteem Scores by College Attending-2.*

Variable	Texas A&M				Blinn			
	AD/HD		Comparison		AD/HD		Comparison	
	<u>(n = 13)</u>		<u>(n = 22)</u>		<u>(n = 8)</u>		<u>(n = 9)</u>	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Global	33.23	(10.71)	33.73	(7.50)	24.13	(6.58)	35.56	(6.84)
Self-esteem								
Likability	34.85	(6.05)	32.91	(7.14)	29.75	(3.45)	36.89	(6.20)
Lovability	40.15	(9.03)	35.59	(7.04)	34.13	(7.68)	40.56	(4.88)
Self-control	36.00	(6.39)	33.46	(6.54)	32.63	(7.62)	38.79	(5.22)
Moral Self-approval	41.38	(6.76)	38.32	(8.30)	36.38	(9.35)	43.89	(6.30)

Table 9 (continued)

College by		
ME by	ME by	AD/HD
<u>College</u>	<u>AD/HD</u>	<u>Interaction</u>
$F(1,48)$	$F(1,48)$	$F(1,48)$
1.62	4.92*	5.86*
0.09	1.90	5.80*
0.00	0.04	5.10*
0.25	0.87	5.04*
0.14	0.91	5.13*

Note: HCC and UH excluded due to insufficient sample size by condition. College Omnibus  $F(5, 44) = 0.07, ns$ . AD/HD diagnosis Omnibus  $F(5, 44) = 0.13, ns$ . College by AD/HD diagnosis interaction omnibus  $F(5, 44) = 5.86, p < .05$ . \*  $p < .05$ .

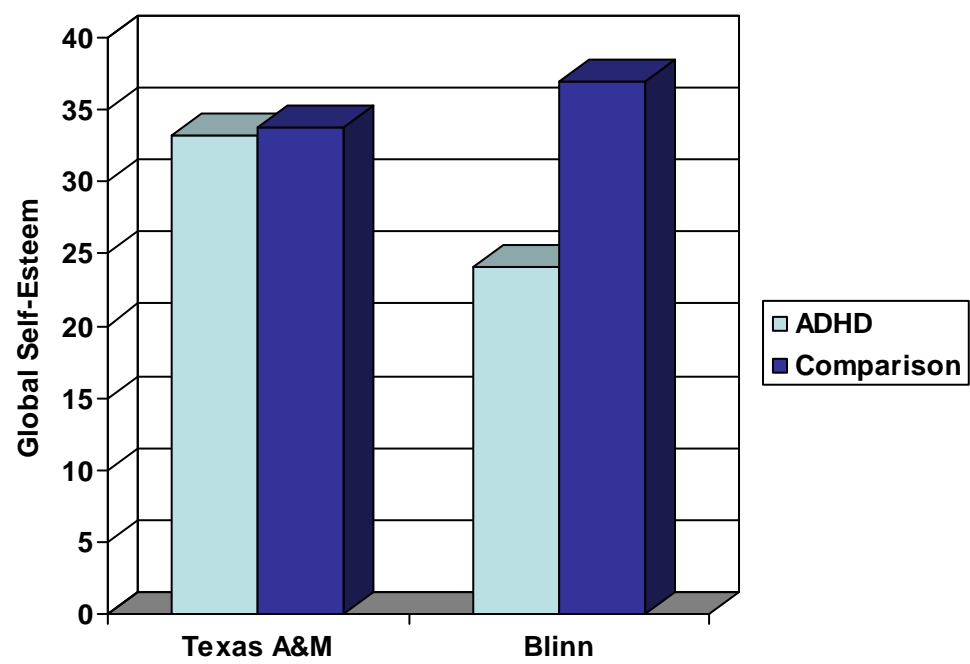


Figure 1. Self-Esteem by School

## CHAPTER V

### CONCLUSIONS

#### *Summary*

The study of male AD/HD patterns have been dominated the literature, while the symptoms of girls and women have been understudied and underreported, possibly due to the fact that their symptoms of inattention are overlooked or missed. Comorbidity, hormonal changes, protective influences, and internalized symptoms in these individuals have caused their AD/HD symptoms to go unnoticed. In 1997, the first study addressing self-esteem in college students with AD/HD was published. Dooling-Litfin and Rosen (1997) compared self-esteem ratings in college students who had a childhood history of AD/HD to control students. Results indicated that those who had a history of AD/HD reported lower self-esteem than controls. However, multiple regression analyses indicated that AD/HD students with higher social skills and fewer current AD/HD symptoms had higher self-esteem. Results of this study also showed that treatment history, having a mentor, or having a special talent were not associated with self-esteem in college students with AD/HD. Other research, as mentioned previously, has revealed that individuals report low self esteem and impaired social relationships as a result of undiagnosed AD/HD. Thus, if these individuals don't get the proper treatment for their AD/HD symptoms, the assumption is that they will continue to endure progressive psychological and academic impairments in the years to come. However, unlike the results found by Dooling-Litfin et al. (1997) that indicated that



protective factors don't have an influence on self-esteem, other studies have found results that suggest otherwise. For instance, studies have reported that protective influences such as treatment for AD/HD symptoms and exceptional family support can increase a students' self-esteem (Quinn, 2005).

Students may struggle with the increased academic demands and rigor required in college. Those students with "hidden" disorders such as AD/HD, Predominantly Inattentive type may be particularly vulnerable due to cognitive and processing deficits. The current study is an attempt to determine the relationship of self esteem and AD/HD in college women.

This study contributes to the limited research literature on the outcomes and experiences of women with AD/HD. Currently, there is insufficient knowledge about women with AD/HD and the impact that the disorder has on their self esteem. This study also aims to investigate whether being diagnosed with AD/HD as a young child as opposed to in adulthood will have an effect on the individuals' current level of self esteem in college. The relationship of medication treatment and the self-esteem of college women with AD/HD will also be observed. Familial support systems the women have and the type of post secondary institution that they attend will also be observed and evaluated with relevance to their present level of self esteem. This study sought to add information to the current literature concerning AD/HD in women by examining the relationship between AD/HD symptoms and the self-esteem of a sample of college women diagnosed and receiving accommodations and services for AD/HD. More specifically, this study expanded upon past research by considering five aspects of self-

esteem that included, global self-esteem, likability, lovability, self-control, and moral self-approval. This study further investigated whether correlations are present between self-esteem and existing variables such as the individual's postsecondary institution, age of diagnosis, and level of family support of participants diagnosed with AD/HD. Four research questions concerning these areas of interest were posed and answered in this study.

### *Discussion*

The first question involved determining whether or not a relationship was present between AD/HD and the self-esteem of college women. As expected, diagnosed women scored significantly higher on Inattention symptoms, Hyperactive/Impulsive symptoms, AD/HD total and index scores. These women were more likely to score in the clinical range on all of the AD/HD scales measured. It is important to note that the majority of these women were prescribed and taking medication for their AD/HD symptoms and still had T-scores one or more standard deviations above the mean. Thus, it is likely that the women in the AD/HD group may have scored higher on all of the AD/HD subscales prior to being prescribed and consuming medication to treat their symptoms. Results of this study indicate that AD/HD inattentive symptoms are strongly and negatively related to an individual's global self-esteem (GSE), moral self-approval (MOR), body appearance (BAP), body functioning (BFN), and self-control (SFC). The study reveals that the more severe an individual's inattentive symptoms are, the lower their GSE (how pleased with themselves they are, how significant they feel as a person, how self-confident they are, how pleased they are with the past, and if they expect future

successes), MOR (how pleased they are with their moral values and behavior and how consistently they act with their moral standards and values, and how positive of a moral example they are for others), BAP (how pleased they are with their appearance), BFN (what physical condition they believe they are in, how healthy they feel, and how comfortable they are with their body) and SFC (how self-disciplined they are, how persevering they are, how good they are at setting and achieving goals, how easily distracted they are, how much they are in control of their emotions, and how much they exercise restraint in eating, drinking, and or/use of drugs) levels will be. Furthermore, results showed that hyperactive/impulsive symptoms of AD/HD were also negatively related to SFC and moral self-approval MOR. It seems that the more hyperactive/impulsive the women felt they were, the less likely they were to rate themselves as being pleased with their behaviors and self-discipline and also less likely to feel they were in control of their emotions. Hyperactive/impulsive symptoms in adult women may be clinically presented by taking part in potentially dangerous activities, having difficulty establishing and maintaining rules, and displaying impatience. Displaying inappropriate behaviors such as these in unwarranted situations may illicit unintended consequences from law enforcers, family, or peers and thus, may affect aspects of the individual's self-esteem. Past research conducted with children diagnosed with AD/HD supports this finding that those with this disorder face challenges with maintaining appropriate social behavior (Nadeau, 2002; Dodson, 20002) and that problems with social adjustment are suggested to continue into adulthood (Gittelman et al. 1985; Weiss & Hechtman, 1993).

Results of this study also showed that the AD/HD total score was negatively related to GSE, SFC, MOR and Competence (CMP). It was determined that the AD/HD index score on the Conner's AD/HD scale was the best predictor of low self-esteem; it was strongly negatively correlated to all of the self-esteem subscales addressed in the present study. These findings are consistent with research that has found that a negative effect of AD/HD for women may be lower levels of self-esteem and negative self-images (Donnelly, 1989; Kelly, Cohen, Walker, Caskey, & Atkinson, 1989; Weiss, Hetchman, & Perlman, 1978; Arcia & Conners, 1998).

An unexpected finding was the lack of a significant difference in the self-esteem between the individuals in the two groups of this study. The lack of significance could be explained by other protective influences not examined in this study such as having supportive friends, being involved and excelling in organizations and extracurricular activities, or having a high intelligence quotient (IQ). Another reason that may account for why the participants did not differ in terms of their self-esteem could be explained by the fact that the individuals with AD/HD who participated in this study were currently receiving disability services and accommodations for their disorder and were taking medication to control their AD/HD symptoms at the time of their participation. These interventions could possibly be a moderator variable acting as a buffer for the individuals' self-esteem. This finding stresses the importance for an individual with the diagnosis of AD/HD to receive appropriate treatment and interventions for their disability.

The second question aimed to determine whether there was a relationship between a childhood diagnosis of AD/HD compared to a diagnosis later in an individual's life. It was predicted that a negative relationship would be present between a childhood diagnosis compared to an adolescent or adult diagnosis of AD/HD; as the age of diagnosis increases, self-esteem will decrease. Contrary to my predictions, participant's self-esteem was not significantly associated with the age in which they were diagnosed with AD/HD. This finding was somewhat unexpected because past research has shown that individuals who were not diagnosed in childhood have reported psychosocial difficulties including self-esteem issues (Rucklidge, Brown, Crawford, & Kaplan, 2007). The study showed that a late diagnosis of AD/HD in adulthood can attribute to the development of psychosocial problems in the individual that can affect the way the individual feels about themselves. Other studies have suggested that when girls with AD/HD are overlooked or left undiagnosed until later in their lives, they may be more susceptible to be at risk for social implications such as lower self-esteem and lower self-image (Arcia, & Conners, 1998; Katz, Goldstein, & Geckle, 1998). The present studies' findings did not support the previous research in this area of interest. The opposing results of this study may be explained by participants' demographics. The participants diagnosed with AD/HD in this study were between the ages of 4 and 23 when they were first diagnosed with the disorder. However, of the 24 women with AD/HD in this study, more than half of them were under the age 17 when they were diagnosed with the disorder. The fact that most participants with this disorder in the study were diagnosed in their childhood may help account for why a significant

correlation was not found between the age of diagnosis and self-esteem levels as other previous studies have found.

The third question involved investigating whether or not a relationship is present between having a positive family support system relative to communication and emotional support and the self-esteem of college women diagnosed with AD/HD. It was predicted that women with AD/HD who had a positive family and social network and support system would have greater self-esteem compared to women diagnosed with AD/HD who did not have a positive support system to rely on. This prediction was based on previous research indicating that a supportive home, emotionally healthy parents, and positive parenting practices can make it more likely that an individual can successfully cope with AD/HD (Tzelepis, Schubiner, & Warbasse, 1995; Ratey, Greenberg, Bemporad, & Lindem, 1992; Okie, 2006). Thus, it was hypothesized that family support would act as a buffer for AD/HD symptoms and allow for higher self-esteem. Although my results showed that family support and AD/HD index scores did predict global self-esteem in women with AD/HD, the interaction was not significant. Thus, contrary to my predictions, family support was not found to be a moderator in the relationship between AD/HD and the self-esteem of women diagnosed with AD/HD.

The two groups in this study did not differ in terms of family communication frequency or emotional support. Nevertheless, results did reveal that the better the emotional support from the family was, the higher a participant's global self-esteem was. A positive correlation was also found between emotional support from the participant's family and aspects of self-esteem including, likability, lovability, and self-control. More

communication with the participant's family was found to reveal increased levels of lovability in the participant.

The final question was posed to determine if there was a relationship between types of postsecondary institutions on the self-esteem of the individual. It was hypothesized that women attending smaller postsecondary institutions would have higher self-esteem as compared to women attending larger postsecondary institutions. The rationale behind this hypothesis is that it was assumed that women attending smaller colleges or universities would have a greater opportunity to live at their permanent address and have closer contact with their family to allow for greater opportunities to communicate with them and receive emotional support from them. Also, smaller postsecondary institutions tend to have classes with fewer numbers of students which potentially allows for more opportunities to develop social networks and establish supportive relationships with teachers.

Thus, participants were assessed on their interest in academic tasks, motivation in their schoolwork, and satisfaction in their learning style. Differences were not found between the two groups in terms of interest in their academic studies; however, it was found that women diagnosed with AD/HD were less motivated with their school work and less satisfied with their learning style as compared to women without a diagnosis of AD/HD. As addressed in research question number three, studies have shown that protective influences such as positive family and social networks can help an individual cope with their AD/HD symptoms (Tzelepis, Schubiner, & Warbasse, 1995; Ratey, Greenberg, Bemporad, & Lindem, 1992; Okie, 2006) which in turn should help increase

an individual's self-esteem. However, contrary to this hypothesis, the opposite results were found. In fact, it was found that women with AD/HD attending Blinn College, the smaller two-year college included in this study had lower levels of self-esteem as compared to women diagnosed with AD/HD and attending Texas A&M University. An initial problem that was found which was relative to the rationale behind the hypothesis to the fourth question was the finding that in terms of housing no difference was found between the participants with AD/HD from the different postsecondary institutions. In fact, the only difference found in terms of housing was that the non-diagnosed women were more likely to live with their parents at their permanent address as compared to the women diagnosed with AD/HD.

The results from this study regarding this question may also be attributable to other extraneous variables not accounted for in the study. For instance, the types of services and accommodations provided to students with AD/HD at the disability services offices at each postsecondary institution could potentially be addressed. Another explanation for this finding may be that women with lower self-esteem may have been too intimidated to attend a larger postsecondary institution and instead chose to attend a smaller college instead. Thus, further studies examining these variables are warranted.

#### *General Limitations*

It is important to note the methodological and conceptual limitations of this study that should be taken into account when interpreting the results. However, the findings from the present study should be considered despite these limitations.



One limitation of this study is that the sample sizes were relatively small and differences were found in the ethnicities of the participants in the two groups. Women in the AD/HD sample were found to be predominantly Caucasian while the non AD/HD group was primarily of Asian decent. A total sample with equal representations of ethnicities would be ideal for this study. However, it is important to note that this disorder is more predominant in white middle class populations and thus, the sample of AD/HD participants in this study may be representative of this notion. This study only included 74 participants, 24 of which were diagnosed with AD/HD. Directors of the Disability Services Office reported that many students expressed an interest in participating in the study. However, many of them did not follow through with actually participating. Some of these students took the inventories with intent to participate in the study, but did not complete or return them to their director, while others lost the materials and chose not to complete another set of inventories. Failure to complete tasks, forgetfulness, lack of organization, and losing or misplacing things are all examples of symptoms of AD/HD. These symptoms of the targeted population need to be taken into consideration when noting this limitation of a small sample size. However, due to the small sample size the results of this study may not be generalizable to the population at large. It is possible that if a larger sample was used, greater power would have been achieved to detect differences between groups. Future studies would likely benefit by being conducted using larger sample sizes with women of different ethnicities represented equally in each group.

Another limitation was that the study relied on self-report protocols. As is true with any self-report instrument, it is possible that participants may not have accurately reported their level of self-esteem. Limiting this research are general problems with the use of the self-report methodology, including the reliance on participants' motivation to answer honestly and the possibility of response bias. Since all of the surveys were anonymous, the self-desirability bias in reporting should have been minimized. However, commensurate reports from peers and parents would have been useful. Verifying participant's self-report of grade point averages and age of diagnosis with collateral sources of information in future work would provide additional evidence of the validity of self-reporting. Future research should be designed to include additional instruments to assess self esteem and self perceptions.

A further limitation of this study is that participants diagnosed with AD/HD were not asked specifically to identify which subtype they were diagnosed with. Subtype variations may have an effect on the individuals' self esteem levels and thus, would be valuable information.

Moreover, no abstinence period from AD/HD medication was required prior to participation in this study. Requiring an abstinence period prior to participation and also having collateral sources verify compliance with this request may eliminate variability due to this potentially confounding variable.

#### *Recommendations for Future Research*

The results of this study provide some insight into the necessity of exploring psychological, academic, and family systems that interact and impact women with

AD/HD. This study highlights the importance to taking these factors into consideration in terms of presentation, assessment, treatment and outcomes of AD/HD in girls and in women. Despite substantial limitations, this study provides some insight on the outcomes of women in college with AD/HD. It also provides evidence for the need of additional research in the area of women with AD/HD; their life-span experience with AD/HD symptoms and the effects of a late diagnosis. Further studies in this area of interest that include larger sample sizes with equal ethnic representations, as well as, substantial representations of students from multiple postsecondary institutions will be necessary in order to determine that the results in this study are in fact generalizable to other college women diagnosed with AD/HD. Researchers are encouraged to consider other variables that were not included in this investigation such as specification of the subtype of AD/HD the individual was diagnosed with, intelligence levels, success in extracurricular activities, active involvement in organizations, socioeconomic status, and even supportive friendships and social networks. These variables may make a difference in an individual's life and therefore, may influence or moderate one's self-esteem levels.

AD/HD was once contributed to being primarily a childhood disorder of males, it has only recently, in the last twenty years, been associated with being an adult disorder. Researchers have suggested that females have gone overlooked or have been underdiagnosed because of their clinical presentations of AD/HD symptoms, referral biases, and also because of having protective influences in their lives (Quinn, 2005; Ratey, Miller, and Nadeau, 1995; Barkley, 1998; Reid, Riccio, Kessler, Dupaul, Power, Anastopoulos, Rogers-Adkinson, Noll, 2000; Reynolds & Kamphaus, 1992). Having a

delayed diagnosis of AD/HD has been shown to affect an individual's self-esteem levels (Rucklidge & Kaplan, 1997; Rucklidge, Brown, Crawford, & Kaplan, 20). Thus, further research should be conducted to explore the manifestation of this disorder in females to determine life-long effects of the symptoms of AD/HD. The potential benefits of avoiding a delayed diagnosis for females are far-reaching.

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## APPENDIX A

**Demographic Information**

DIRECTIONS: Please fill in the blanks or check the appropriate information as it pertains to you.

Age: \_\_\_\_\_

Gender: \_\_\_\_\_ Male \_\_\_\_\_ Female

Ethnicity: \_\_\_\_\_ Please Specify

Postsecondary Institution: \_\_\_\_\_ Blinn College-Bryan  
 \_\_\_\_\_ Texas A&M University  
 \_\_\_\_\_ Houston University or College

Housing: \_\_\_\_\_ Live at permanent address with family and commute to institution  
 \_\_\_\_\_ Live in dorm/apartment/duplex near institution

On a scale ranging from 1 to 3 (1= never, 2= sometimes, 3= always) please answer the following two questions.

How frequently can you go to your family for emotional support? \_\_\_\_\_

How often do you communicate with or see your family? \_\_\_\_\_

Class Status: \_\_\_\_\_ Freshman \_\_\_\_\_ Sophomore  
 \_\_\_\_\_ Junior \_\_\_\_\_ Senior

Grade Point Average (GPA): \_\_\_\_\_

At what age were you diagnosed with AD/HD? \_\_\_\_\_

Not Diagnosed with AD/HD \_\_\_\_\_

Have you been diagnosed with any other psychological disorders? \_\_\_\_ yes \_\_\_\_ no  
 If "yes", what was it \_\_\_\_\_

Have you ever been prescribed medication for AD/HD symptoms? \_\_\_\_ yes \_\_\_\_ no  
 If "yes", what medications do you take and how long have you taken them?

\_\_\_\_\_  
 If "yes", are you currently taking these prescribed medications? \_\_\_\_ yes \_\_\_\_ no

Do you currently receive any modifications or special services in college? \_\_\_\_ yes  
\_\_\_\_ no

On a scale ranging from 1 to 3 (1= not typical, 2= somewhat typical, 3= very much typical) please answer the following three statements.

I am interested in and enjoy my academic tasks. \_\_\_\_\_

I am willing and motivated to work hard in school on my academic tasks. \_\_\_\_\_

I am satisfied with the way I learn information and acquire knowledge. \_\_\_\_\_

THANK YOU FOR YOUR PARTICIPATION!

## APPENDIX B

## CONSENT FORM

## The Relationship of AD/HD and the Self-Esteem of College Women

You have been asked to participate in a research study regarding self-esteem and AD/HD. You were selected to be a possible participant because of your gender or use of disability services. One hundred to two hundred people have been asked to participate in this study. The purpose of this study is to observe the relationship of AD/HD and self-esteem in college women at postsecondary institutions in Texas including **Blinn College, Texas A&M University, and postsecondary institutions in the Houston area.**

If you agree to be in this study, you will be asked to complete two questionnaires and a demographic information form. This study will take approximately one hour to complete. You will receive no direct benefit or consequence for participating in this study.

You will be part of a group of college students with and without AD/HD who are enrolled at Blinn College and Texas A&M University participating in this study. Data collection will begin in the Summer of 2007 and will continue until data collection is deemed to be complete by the principal investigator.

You can choose to have your name entered in a drawing for \$200 upon completion of the demographic information form and questionnaires. The drawing will not be held until the necessary number of questionnaires has been obtained for this study. If you withdraw from the study, you will still be eligible for the cash drawing.

This study is confidential in regards to all materials and information obtained. The records of this study will be kept private. No identifiers linking you to the study will be included in any sort of report that might be published. Research records will be stored securely and only I or my dissertation research committee including Dr. Mike Ash, Dr. Cyndi Riccio, Dr. Bill Rae, or Dr. Emily Davidson will have access to the records. Your decision whether or not to participate will not affect your current or future relations with Texas A&M University, Blinn College, or your Disability Services Office. If you decide to participate, you are free to refuse to answer any of the questions that may make you uncomfortable. You can withdraw at any time without your relations with the University, job, benefits, etc., being affected. You can contact me, Reni Joseph via email at [reni-joseph@tamu.edu](mailto:reni-joseph@tamu.edu) or by phone at 832-489-4615. My committee chair, Dr. Mike Ash can also be contacted via email at [mash@tamu.edu](mailto:mash@tamu.edu) with any questions about this study.

This research study has been reviewed by the Institutional Review Board - Human Subjects in Research, Texas A&M University. For research-related problems or questions regarding subjects' rights, you can contact the Institutional Review Board through Ms. Melissa McIlhaney, IRB Program Coordinator, Office of Research Compliance, (979)458-4067, [mcilhaney@tamu.edu](mailto:mcilhaney@tamu.edu).

Please be sure you have read the above information, asked questions and received answers to your satisfaction. You will be given a copy of the consent form for your records. By signing this document, you consent to participate in the study.

Signature of Participant:

Date: \_\_\_\_\_

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